


GENERAL NOTES

- APPROXIMATE LOCATIONS OF EXISTING MAINS ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING MAINS AND SERVICES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
- TOPOGRAPHIC FIELD SURVEYS WERE PERFORMED ON MARCH 2007 BY KCI TECHNOLOGIES INC.
- HORIZONTAL AND VERTICAL SURVEY CONTROLS:
THE HORIZONTAL DATUM IS ASSUMED, AND THE MERIDIAN SHOWN IS BASED ON RECORD PLATS. THE VERTICAL DATUM IS BASED ON THE PUMP STATION FINISHED FLOOR ELEVATION AS A BENCH-MARK.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- CLEAR ALL UTILITIES BY A MINIMUM OF 12 INCHES. CLEAR ALL POLES BY 5'-0" MINIMUM OR TUNNEL AS REQUIRED UNLESS OTHERWISE NOTED. THE OWNER HAS CONTACTED THE UTILITY COMPANIES AND HAS MADE ARRANGEMENTS FOR BRACING OF POLES AS SHOWN ON THE DRAWINGS. IN THE EVENT THE CONTRACTOR'S WORK REQUIRES THE BRACING OF ADDITIONAL POLES, ANY COST INCURRED BY THE OWNER FOR THE BRACING OF ADDITIONAL POLES OR DAMAGES SHALL BE DEDUCTED FROM MONIES OWED THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES TO SCHEDULE THE BRACING OF THE POLES.
- FOR DETAILS NOT SHOWN ON THE DRAWING, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
- WHERE TEST PITS HAVE BEEN MADE ON EXISTING UTILITIES, THEY ARE NOTED BY THE SYMBOL  AT THE LOCATIONS OF THE TEST PITS. A NOTE OR NOTES CONTAINING THE RESULTS OF THE TEST PIT OR PITS IS INCLUDED ON THE DRAWINGS. EXISTING UTILITIES IN THE VICINITY OF THE PROPOSED WORK FOR WHICH TEST PITS HAVE NOT BEEN DUG SHALL BE LOCATED BY THE CONTRACTOR TWO WEEKS IN ADVANCE OF CONSTRUCTION OPERATIONS AT HIS OWN EXPENSE.
- THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:

AT&T	1-800-252-1133
BGE (CONSTRUCTION SERVICES)	410-637-8713
BGE (EMERGENCY)	410-685-0123
BUREAU OF UTILITIES	410-313-4900
COLONIAL PIPELINE CO	410-795-1390
MISS UTILITY	1-800-257-7777
STATE HIGHWAY ADMINISTRATION	410-531-5533
VERIZON	1-800-743-0033
- TREES AND SHRUBS ARE TO BE PROTECTED FROM DAMAGE TO THE MAXIMUM EXTENT. TREES AND SHRUBS LOCATED WITHIN THE CONSTRUCTION STRIP ARE NOT TO BE REMOVED OR DAMAGED BY THE CONTRACTOR.
- THE CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG THE LINE OF EXCAVATION. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE MAIN.
- THE CONTRACTOR SHALL NOTIFY THE BUREAU OF HIGHWAYS, HOWARD COUNTY, AT (410)-313-7450 AT LEAST FIVE WORKING DAYS BEFORE OPEN CUTTING OR BORING/JACKING OF ANY COUNTY ROAD FOR LAYING WATER/SEWER MAINS OR HOUSE CONNECTIONS. THE APPROVAL OF THESE DRAWINGS WILL CONSTITUTE COMPLIANCE WITH DPW REQUIREMENTS PER SECTION 18.114(A) OF THE HOWARD COUNTY CODE.
- CONTRACTOR SHALL COORDINATE WITH THE COUNTY FOR OPERATIONS OF ALL PUMPS AND VALVES, AND TAKE ALL PRECAUTIONS TO PROTECT EQUIPMENT, WATER MAINS AND MAINTAIN SCHEDULED SERVICE AND OPERATIONS.

SEQUENCE OF CONSTRUCTION

SUMMARY: THE STATION SHALL BE MAINTAINED FOR NORMAL OPERATIONS THROUGHOUT THE ENTIRE CONSTRUCTION PHASE. DURING THIS PERIOD THE 2400 VAC PUMPS CAN BE RUN IN FULL OPERATION, ONLY TO BE SHUTDOWN FOR SHORT PERIODS OF TIME AS REQUIRED. STATION SHUTDOWNS SHALL BE COORDINATED WITH THE COUNTY. MOBILIZATION SHALL INCLUDE SEDIMENT AND EROSION CONTROL MEASURES, SITE SECURITY AND CONSTRUCTION STAGING. CONSTRUCTION SHALL BEGIN WITH REMOVAL OF THE EX. VFD EQUIPMENT, FOLLOWED BY A SEQUENTIAL INSTALLATION OF THE POWER DISTRIBUTION AND POWER TRANSFER EQUIPMENT. THE GENERATOR AND VFD EQUIPMENT SHALL BE INSTALLED FOLLOWED BY CONTROLS AND CONTROL SYSTEM MODIFICATIONS. MECHANICAL IMPROVEMENTS SHALL BE MADE TO SUPPORT ELECTRICAL AND CONTROL SYSTEMS. FINALIZED SITE WORK AND LANDSCAPING SHALL INCLUDE NORMAL AND STANDBY POWER OPERATIONS OF THE 480VAC WATER BOOSTER PUMPS.

SEQUENCE: THE FOLLOWING GENERAL SEQUENCE SHALL BE PREFORMED.

- SITE SEDIMENT AND EROSION CONTROL.
- SITE EXCAVATION AND CLEARING FOR GENERATOR INSTALLATION.
- NEW STANDBY POWER DISTRIBUTION CONDUITS, DUCTBANK AND PULL BOXES.
- NEW VFD/ATS POWER DISTRIBUTION CONDUITS.
- NEW VFD's WITH BYPASS STARTERS AND HARMONIC FILTERS.
- NEW GENERATOR WITH ENCLOSURE AND PLATFORMS.
- NEW INTERIOR PLATFORMS.
- NEW ATS.

ELKRIDGE PUMP STATION

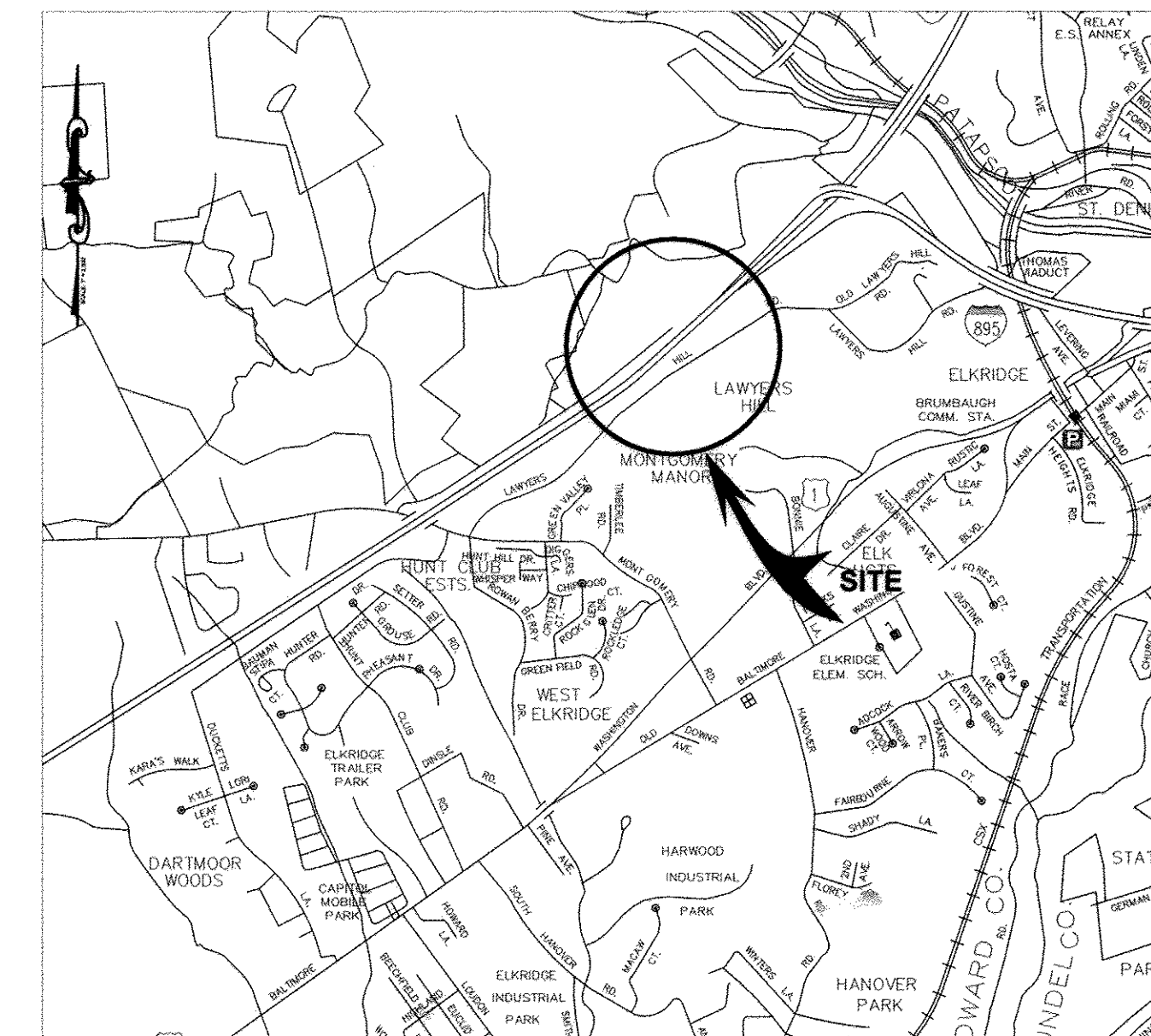
IMPROVEMENTS

DEPARTMENT OF PUBLIC WORKS

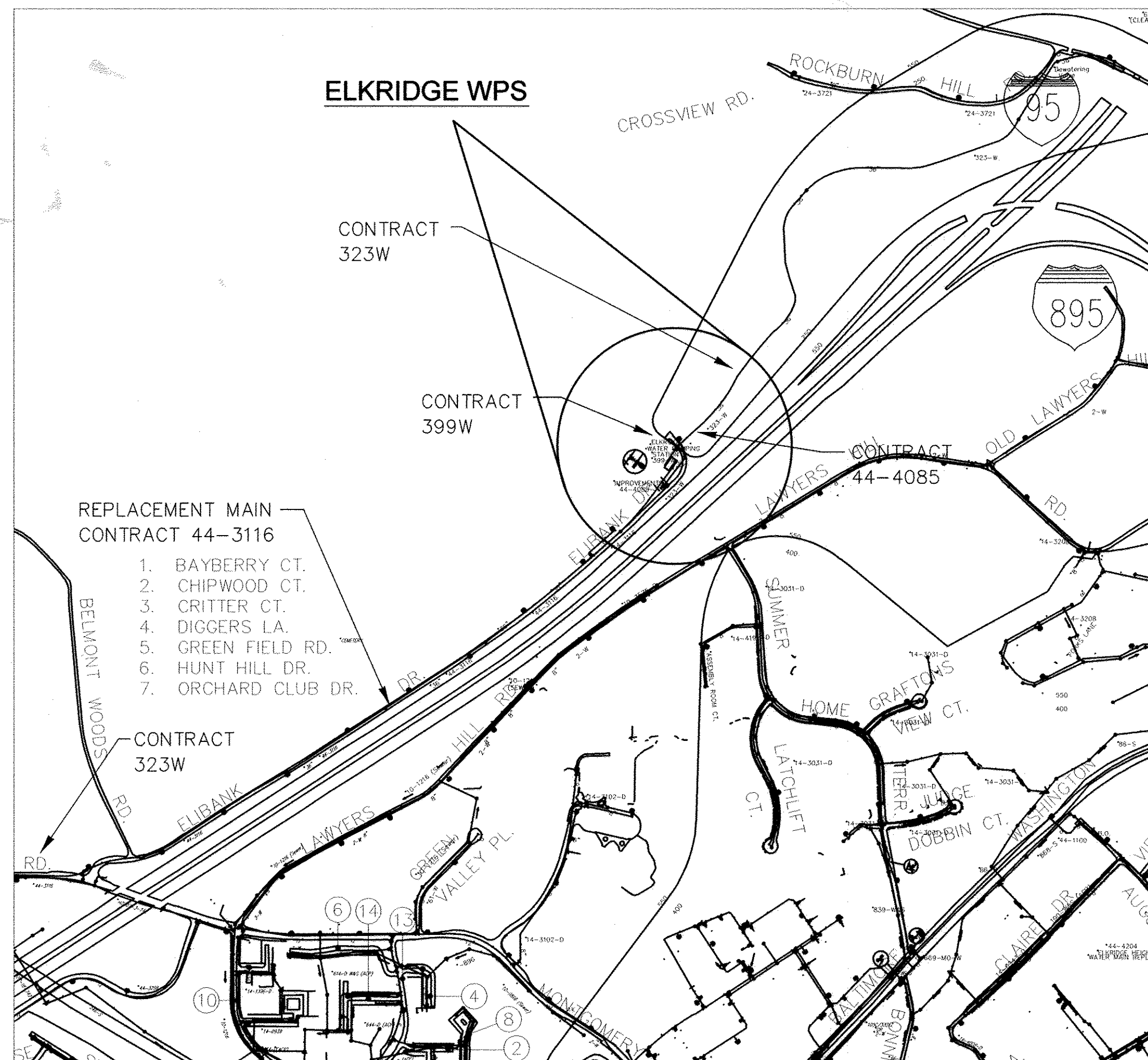
HOWARD COUNTY, MARYLAND

CONTRACT NO. 44-4793

CAPITAL IMPROVEMENT PROJECT NO. W-8317



VICINITY MAP
SCALE: 1" = 2000'



ADC MAPS
MAP NO.: 4937
BLOCK: D-5

LOCATION MAP
SCALE: 1" = 600'

- NEW MTS WITH LOAD BANKS.
- NEW TRANSFORMER FOR MCC-CC2.
- EXPAND EXISTING LC2000 CONTROLLER FOR STANDBY POWER OPERATIONS AND I/O. PROVIDE CONTROL PROGRAMMING.
- INTERFACE STANDBY POWER CONTROLS WITH STATION CONTROLLER AND GENERATOR INCLUDING ATS INTERLOCKS AND SEQUENCE.
- MODIFIED CONTROL SYSTEM PROGRAMMING AT THE MC9710 CONTROLLER.
- NEW VENTILATION FANS WITH DUCTWORK, MOTORIZED DAMPERS AND CONTROL PANEL.
- NEW WATER SYSTEM MONITOR.
- STARTUP AND TESTING.
- EXPAND ASPHALT DRIVEWAY FOR GENERATOR ACCESS.
- LANDSCAPING FOR GENERATOR.
- PROJECT CLOSEOUT.

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
G-1	GENERAL - TITLE SHEET
C-1	CIVIL - SITE PLAN, LEGEND AND DETAILS
C-2	CIVIL - LANDSCAPING, PLAN AND DETAILS
SC-1	CIVIL - EROSION AND SEDIMENT CONTROL NOTES AND DETAILS
S-1	STRUCTURAL - PLATFORM PLAN, DETAILS, SECTIONS AND NOTES
M-1	MECHANICAL LEGEND, ABBREVIATIONS, AND GENERAL NOTES
M-2	MECHANICAL PLANS
M-3	GENERATOR PLAN, SECTION AND DESIGN CRITERIA
ED-1	ELECTRICAL - PLAN PUMP STATION DEMOLITION
E-1	ELECTRICAL - PLAN PUMP STATION
E-2	ELECTRICAL - PLAN GENERATOR
E-3	ELECTRICAL - SINGLE LINE DIAGRAM
E-4	ELECTRICAL - PANELBOARD SCHEDULE
I-1	INSTRUMENTATION - GENERAL NOTES, LEGEND AND KEY PLAN
I-2	INSTRUMENTATION - CONTROL DIAGRAM SYMBOLS
I-3	INSTRUMENTATION - PUMPING SYSTEM P&ID
I-4	INSTRUMENTATION - STANDBY POWER SYSTEMS P&ID
I-5	INSTRUMENTATION - PUMP CONTROLS (ECD)
I-6	INSTRUMENTATION - PUMP CONTROLS (ECD)
I-7	INSTRUMENTATION - PANEL ELEVATIONS AND DETAILS
I-8	INSTRUMENTATION - VENTILATION CONTROLS

GRAPHIC SCALE



PROFESSIONAL CERTIFICATION.
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33925, Expiration Date 1/15/15

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 10/24/14
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 10/24/14
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 10/24/14
CHIEF, UTILITY DESIGN DIVISION DATE

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[Professional Engineer Seal]
10/15/14

DES: SEA	JFW	AS - BUILT'S	12-22-17
DRN: JFW			
CHK: SEA			
DATE: 10/2014	BY: NO.	REVISION	DATE
			1000 SCALE MAP NO. 32
			BLOCK NO.20

TITLE SHEET

ELKRIDGE PUMP STATION IMPROVEMENTS
HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

G-1
SCALE AS SHOWN
SHEET 1 OF 21

AS BUILT

KCI TECHNOLOGIES PROJECT No.: 13-12267718

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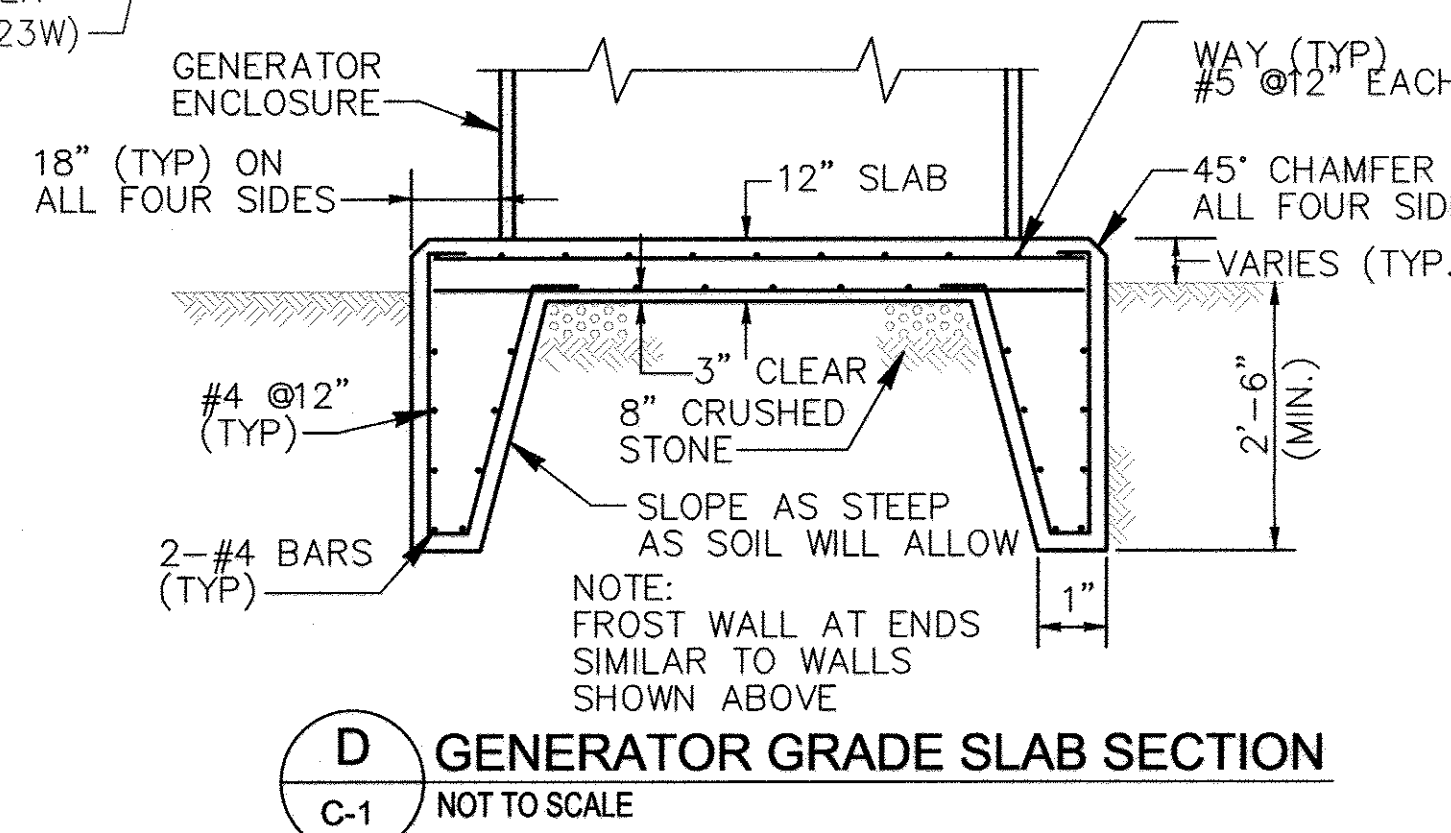
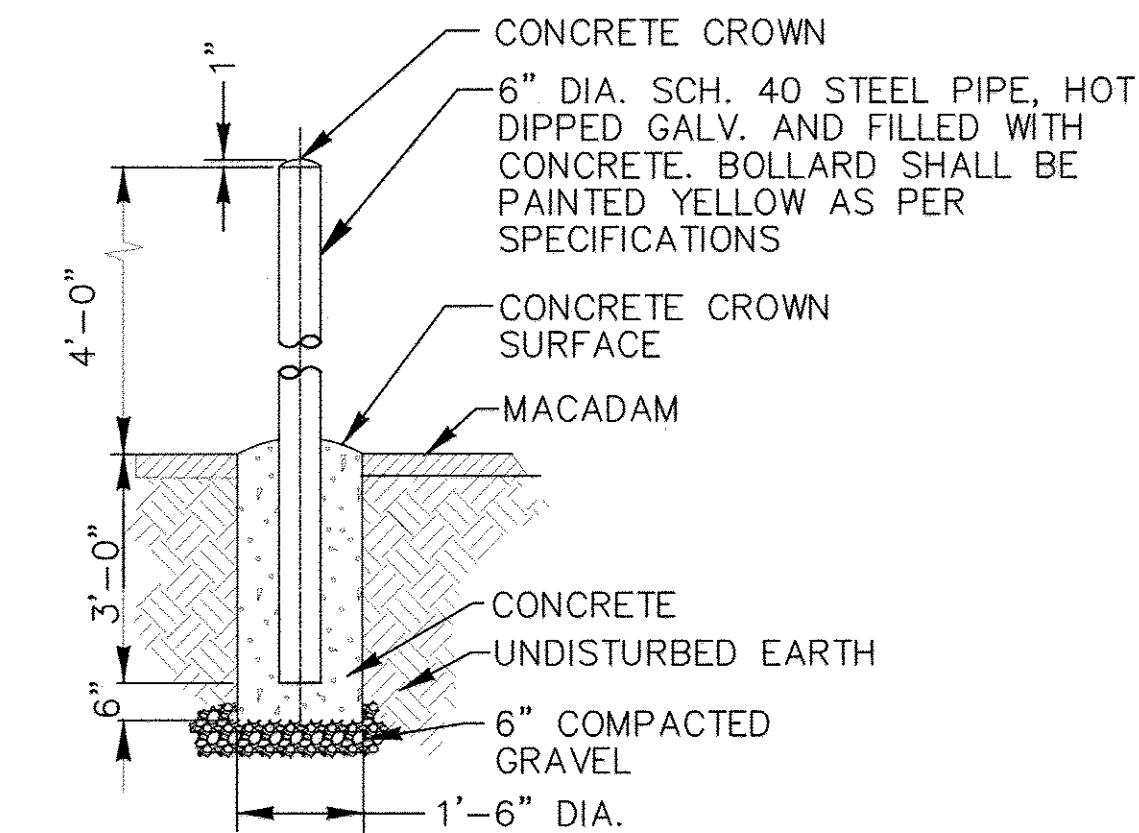
P.O.B.

TABLE 1:

STRUCTURAL FILL COMPACTION GUIDELINES			
AREAS OF FILL PLACEMENT	PROCTOR COMPACTION METHODS		MOISTURE CONTENT (PERCENT OF OPTIMUM)
	ASTM D 698 STANDARD	ASTM 1557 MODIFIED	
BENEATH LANDSCAPED/GRASS AREAS	92%	90%	AS NECESSARY TO OBTAIN DENSITY

NOTES:

- CONTRACTOR TO VERIFY EXISTING FIELD CONDITIONS PRIOR TO PERFORMING SITE IMPROVEMENTS. CONTRACTOR SHALL VERIFY SITE UTILITY LOCATIONS AND SITE SPECIFIC DIMENSIONS.
- ELEVATIONS SHOWN ARE BASED UPON FIRST FLOOR ELEVATION OF EXISTING ELK RIDGE WATER PUMPING STATION 213.00'.
- TRAVERSE POINT NO.2 SHOWN FOR SURVEY REFERENCE. SEE TRAVERSE POINT COORDINATES BELOW FOR POINTS NO.1, NO.2, AND NO.3.
- M.S.R.C. PLAT NO.31902 AND 34003. LIBER 669, FOLIO 489.
- PROVIDE TEMPORARY FENCING TO SECURE AND SAFEGUARD THE SITE IN ACCORDANCE WITH LIMITS OF DISTURBANCE AND STAGED CONSTRUCTION ACTIVITIES.
- IF SOILS ARE DEEMED UNSUITABLE BY GEOTECH. ENGINEERING FOR ALLOWABLE BEARING PRESSURE OF 1000 P.S.F. PERFORM SUBGRADE PREP TILL SUITABLE SOIL IS OBTAINED AND APPROVED BY GEOTECH ENGINEER.
- PLACE SLAB-ON-GRADE CONSTRUCTION FOR GENERATOR/PAD ON NO. 57 STONE AGGREGATE AND / OR COMPACTED STRUCTURAL FILL OVERLAYING FIRM INORGANIC NATURAL SOILS. USE A NET ALLOWABLE BEARING PRESSURE OF 1,000 PSF.
- SUBGRADE PREPARATION: PRIOR TO PLACING NEW FILL, EXCAVATE THE TOP THREE FEET OF SOILS TO REMOVE TOPSOIL, ORGANICS, DISTURBED AND UNSUITABLE MATERIALS. PROOF-ROLL COMPACTION OF EXPOSED SUBGRADES SHALL BE PERFORMED TO DENSIFY SOILS IN -SITU AND/OR TO DETECT DISTURBED GROUND AREAS AS EVIDENCED BY PUMPING OR SHIFTING BEHAVIOR. ANY DISTURBED AND LOOSE/SOFT SOILS ENCOUNTERED DURING EXCAVATION AND AT FOOTING SUBGRADE SHALL BE REMOVED AND REPLACED WITH COMPACTED FILL AND/OR NO. 57 STONE AGGREGATE AS DIRECTED BY THE OWNER.
- STRUCTURAL FILL MATERIALS SHALL HAVE A UNIFIED SOILS CLASSIFICATION OF GW, GP, GM, GC, SW, SP, SM WITH NOT MORE THAN 20 PERCENT FINES CONTENT, AND HAVING PLASTIC INDICES OF LESS THAN 10 PERCENT. USE NO. 57 STONE AGGREGATE WHEN WATER IS ENCOUNTERED. FILL USED WITHIN THE BUILDING AREAS OR FOR REPLACEMENT IN ANY UNDERCUT AREAS SHALL BE COMPACTED IN THIN LIFTS OF 6 TO 12 INCHES BASED ON COMPACTION EQUIPMENT. STRUCTURAL FILL COMPACTION REQUIREMENTS ARE INDICATED ON TABLE 1.
- FOR GRADE SLAB DETAILS SEE DRAWING E-2. GENERATOR PAD AT EL. 212.83.
- INSTALL NEW MACADAM WITH APPROVED SUBGRADE AND COURSE CONSTRUCTION IN ACCORDANCE WITH COUNTY DETAIL R-2.01, PAVING SECTION P-3.



CIVIL SYMBOLS AND ABBREVIATIONS:

- PROPERTY MARKER
- STORM DRAIN MANHOLE
- Ⓜ TELEPHONE BOX
- △ TRAVERSE POINT
- EX. WATER VALVE
- w — EX. WATER MAIN
- DIA. DIAMETER
- EL. ELEVATION
- EX. EXISTING
- FF FINISHED FLOOR
- FT. FEET
- NO. NUMBER
- P.O.B. POINT OF BEGINNING
- S.S. STAINLESS STEEL
- TYP. TYPICAL
- — — — — EXISTING FEATURES
- — — — — EXISTING BERM CURB
- — — — — PROPERTY LINE
- 214 — PROPOSED GRADE
- — — — — NEW FEATURES
- SF — SILT FENCE
- LOD — LIMITS OF DISTURBANCE
- ▨ EARTH

TRAVERSE POINTS

- N=996.562 } NOT SHOWN
E=1026.511
EL.=234.826'
- N=1110.261 } ROADWAY LOCATION SHOWN
E=1207.524
EL.=209.036'
- N=863.015 } NOT SHOWN
E.=1116.191
EL.214.378'

SITE EXCAVATION

TOTAL LIMITS OF DISTURBANCE 4811 SQ. FT.
CUT QUANTITY 96 CUBIC YDS.
FILL QUANTITY 44 CUBIC YDS.
MASS BALANCE REMOVE 52 CUBIC YDS.
MACADAM WORK 113 SQ. FT.

CONSTRUCTION NOTES

① A SUMMATION OF CHANGES IN SITE DRAINAGE TO EVALUATE THE NEED FOR SWM MEASURES. NO SWM REQUIRED, BMP EMPLOYED, SEE DRAWING SC-1.

PROFESSIONAL CERTIFICATION.
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 33925, Expiration Date 1/15/19

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REGISTERED PROFESSIONAL ENGINEER
NO. 33925

DES: SEA	JFW	AS-BUILTS	12/22/2017
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CHK: SEA			
DATE: 10/2014	BY: NO.	REVISION	DATE

CIVIL - SITE PLAN
LEGEND AND DETAILS

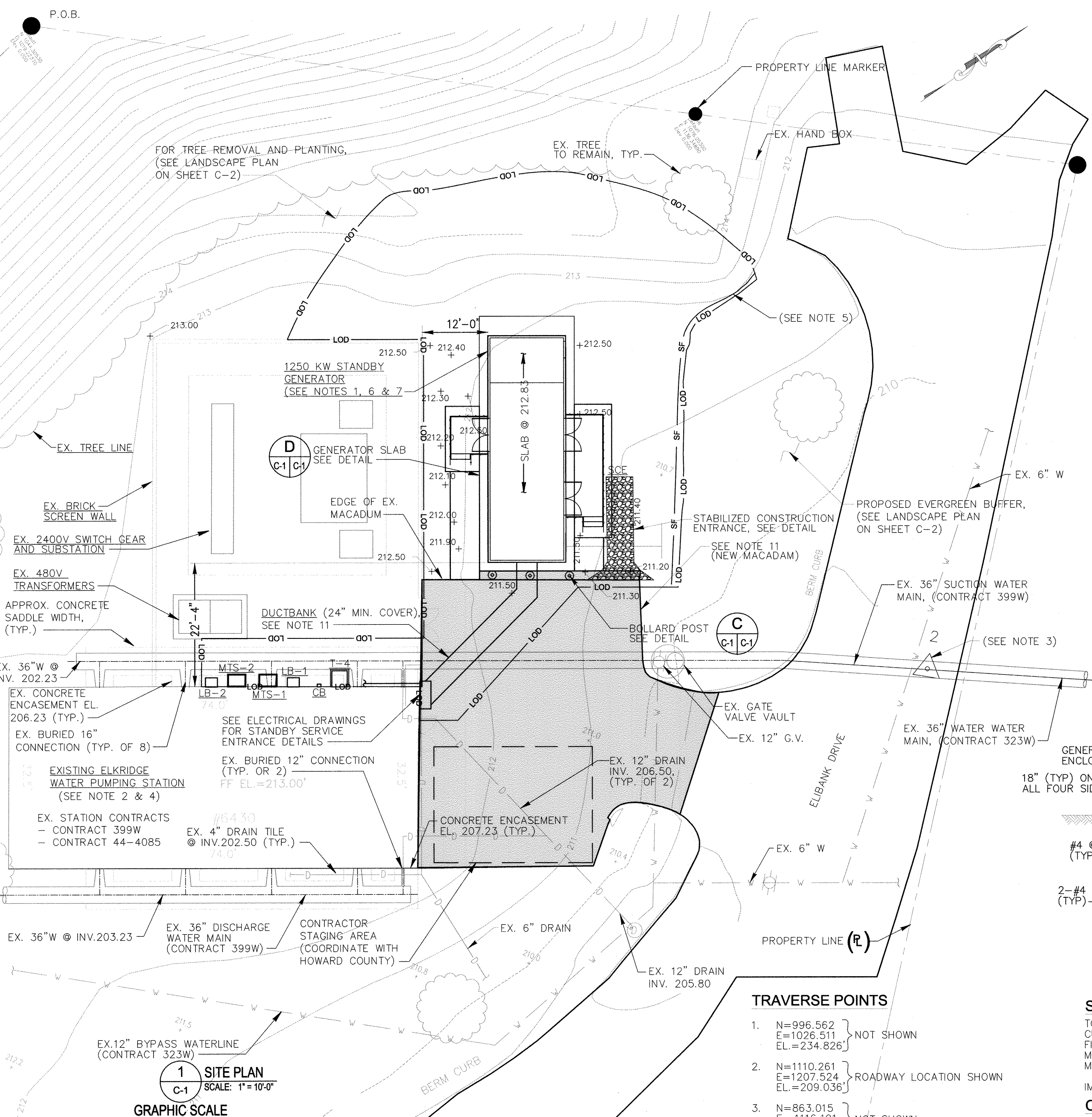
1000 SCALE MAP NO. 32
BLOCK NO.20

ELK RIDGE PUMP STATION
IMPROVEMENTS
HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

SCALE AS SHOWN
SHEET 2 OF 21

KCI TECHNOLOGIES PROJECT No.: 13-12267718

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FOR TREE REMOVAL AND PLANTING, (SEE LANDSCAPE PLAN ON SHEET C-2)

EX. TREE TO REMAIN, TYP.

PROPERTY LINE MARKER

EX. HAND BOX

1250 KW STANDBY GENERATOR (SEE NOTES 1, 6 & 7)

D GENERATOR SLAB SEE DETAIL

EDGE OF EX. MACADAM

STABILIZED CONSTRUCTION ENTRANCE, SEE-DETAIL

PROPOSED EVERGREEN BUFFER, (SEE LANDSCAPE PLAN ON SHEET C-2)

BOLLARD POST SEE DETAIL

EX. GATE VALVE VAULT

EX. 12" G.V.

EX. 36" SUCTION WATER MAIN, (CONTRACT 399W)

EX. 36" WATER MAIN, (CONTRACT 323W)

EX. BRICK SCREEN WALL

EX. 2400V SWITCH GEAR AND SUBSTATION

EX. 480V TRANSFORMERS

APPROX. CONCRETE SADDLE WIDTH, (TYP.)

DUCTBANK (24" MIN. COVER), SEE NOTE 11

EX. CONCRETE ENCASUREMENT EL. 206.23 (TYP.)

EX. BURIED 16" CONNECTION (TYP. OF 8)

EXISTING ELK RIDGE WATER PUMPING STATION (SEE NOTE 2 & 4)

EX. STATION CONTRACTS - CONTRACT 399W - CONTRACT 44-4085

SEE ELECTRICAL DRAWINGS FOR STANDBY SERVICE ENTRANCE DETAILS

EX. BURIED 12" CONNECTION (TYP. OR 2) FF EL.=213.00'

EX. 4" DRAIN TILE @ INV.202.50 (TYP.)

EX. 36" W @ INV.203.23

EX. 36" DISCHARGE WATER MAIN (CONTRACT 399W)

CONTRACTOR STAGING AREA (COORDINATE WITH HOWARD COUNTY)

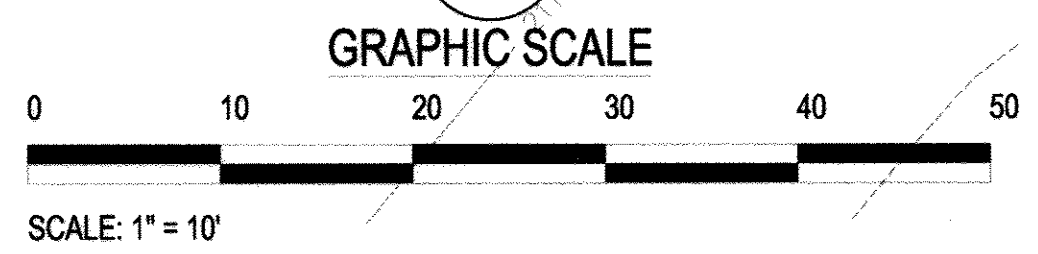
EX. 6" DRAIN

EX. 12" DRAIN INV. 205.80

PROPERTY LINE (R)

EX.12" BYPASS WATERLINE (CONTRACT 323W)

1 SITE PLAN SCALE: 1"=10'-0"



DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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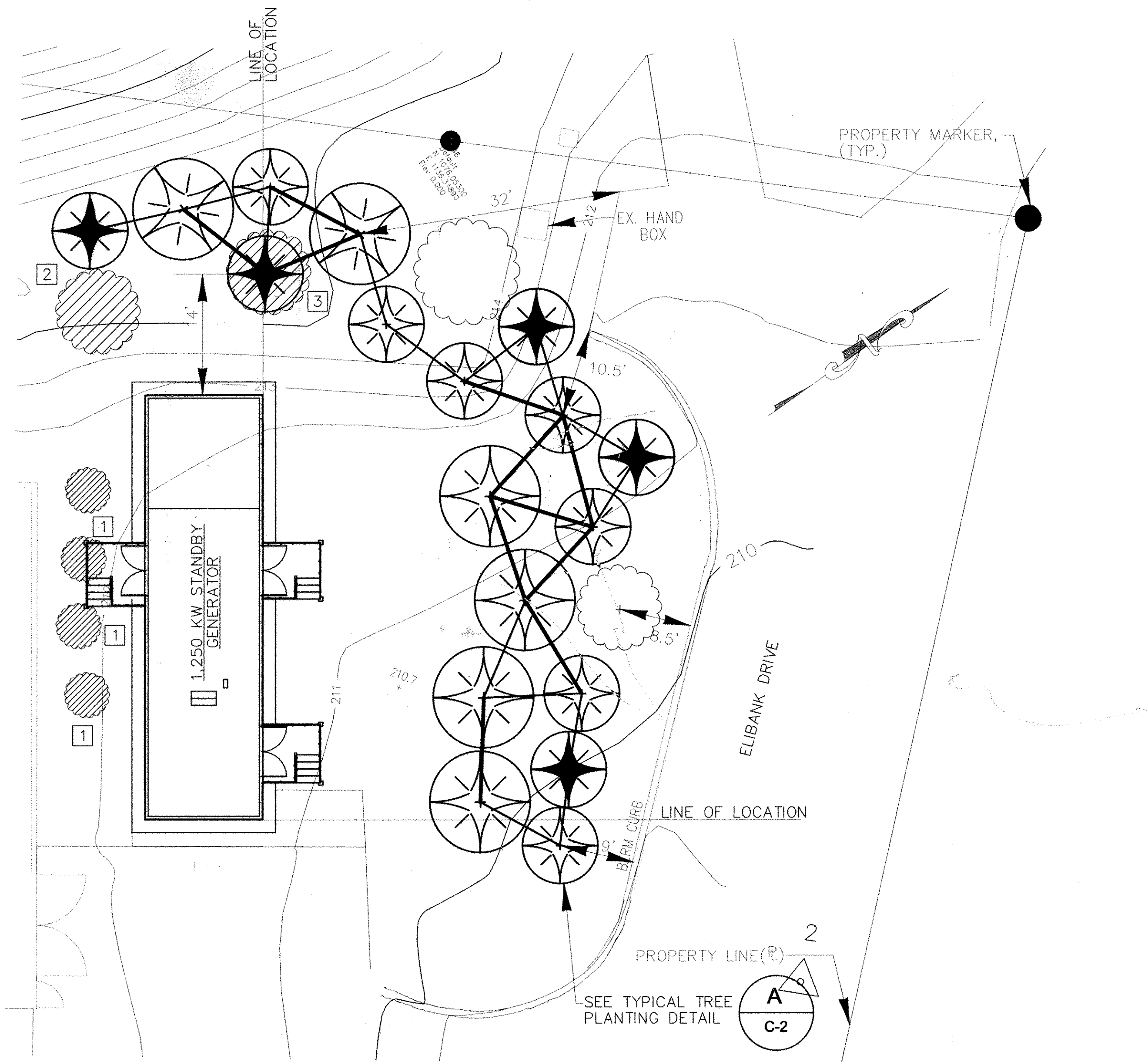
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DATE: 10/2014	BY: NO.	REVISION	DATE

CIVIL - SITE PLAN
LEGEND AND DETAILS

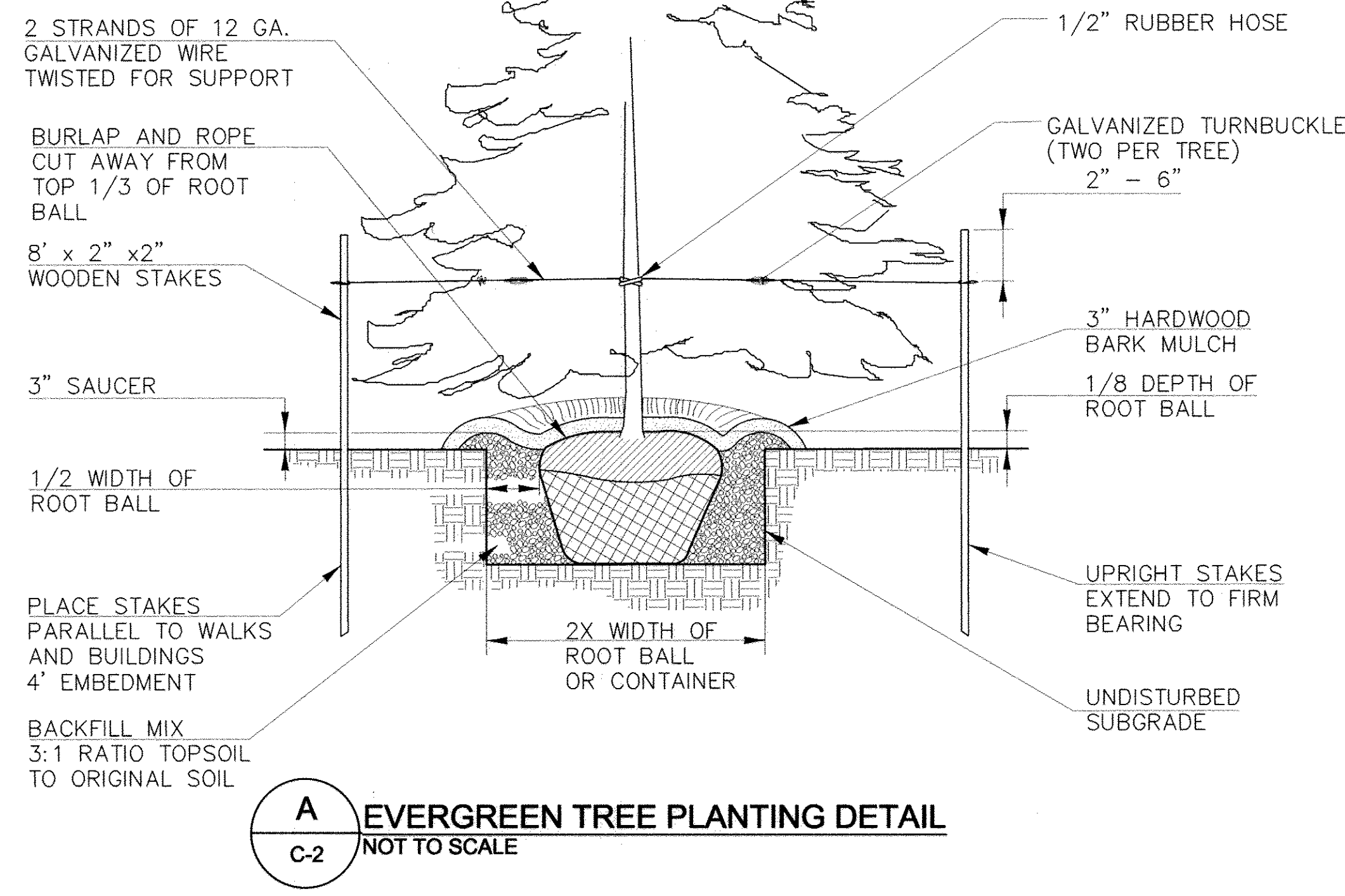
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BLOCK NO.20

ELK RIDGE PUMP STATION
IMPROVEMENTS
HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

SCALE AS SHOWN
SHEET 2 OF 21



1 LANDSCAPE PLAN
C-2 SCALE: 1"=10'-0"



GENERAL LANDSCAPE NOTES

1. THE LANDSCAPE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND UTILITY LOCATIONS SHOWN WITHIN THE PROJECT LIMITS AND SHALL INFORM THE ENGINEER OF ANY DISCREPANCIES OR POTENTIAL PROBLEMS PRIOR TO COMMENCING WORK.
2. ALL PLANTING AND MULCHING SHALL BE DONE IN ACCORDANCE WITH THE MDSA BOOK OF STANDARDS, HIGHWAY AND INCIDENTAL STRUCTURES, CATEGORY 7 - LANDSCAPING.
3. DO NOT PLANT TREES OR SHRUBS WITHIN 5'-0" OF THE CENTERLINE OF UNDERGROUND UTILITIES LINES. DO NOT PLANT TREES WITHIN 10'-0" OF THE CENTERLINE OF OVERHEAD UTILITY LINES. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING 'MISS UTILITY' AT 1-800-257-7777 A MINIMUM OF 72 HOURS PRIOR TO PROCEEDING WITH ANY EXCAVATION FOR PLANT MATERIAL INSTALLATION.
4. ALL TREES GREATER THAN OR EQUAL TO 6'-0" IN HEIGHT SHALL BE STAKED PER THE PLANTING DETAILS.
5. TREES, SHRUBS AND/OR ANY TYPE OF WOODY VEGETATION ARE NOT TO BE PLANTED ON ANY EMBANKMENT COMPRISED OF FILL MATERIALS.
6. TREES AND SHRUBS ARE NOT TO BE PLANTED WITHIN 10 FEET OF THE TOE OF SLOPE OR WITHIN 25 FEET OF ANY DRAINAGE STRUCTURES OR PIPES.

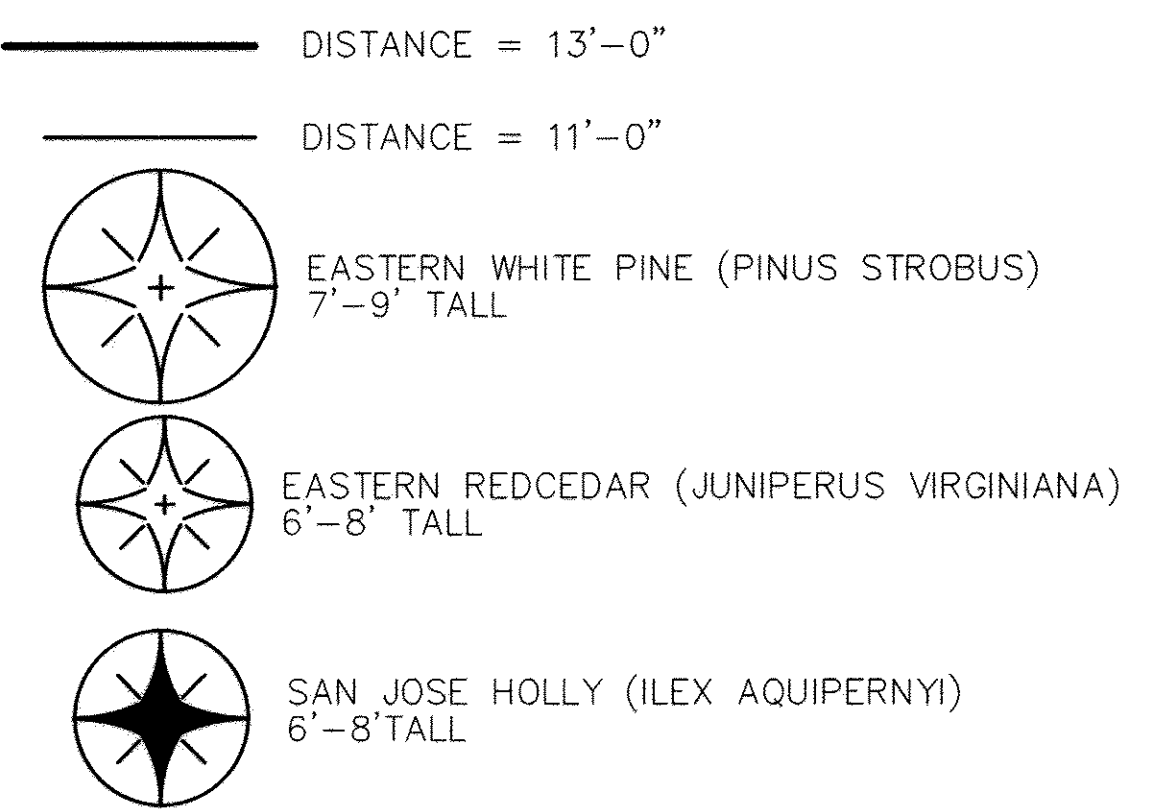
CARE OF PLANTS AFTER CONSTRUCTION

1. IF SOILS ARE NOT WET, THE AREA WILL BE WATERED IMMEDIATELY AFTER PLANTING. THE SOIL SUBSTRATE MUST BE KEPT SATURATED DURING PLANTING AND CONTINUED ACCORDING TO CLIMATIC CONDITIONS AND UNTIL PLANTINGS BECOME FULLY ESTABLISHED AS DETERMINED BY THE PROFESSIONAL LANDSCAPER.
2. 3-WEEKS AFTER PLANTING, THE TREES SHALL BE TREATED WITH (BT) BACTERIA OR EQUAL PREVENTIVE MEASURE TO PROTECT THE TREES FROM BAGWORMS. THE TREES SHALL REQUIRE TREATMENT BETWEEN MAY AND AUGUST PLANTING SEASON. FALL PLANTING SHALL NOT REQUIRE TREATMENT.

NOTES

1. SEE CIVIL-SITE PLAN, C-1, FOR DETAILS AND GRADING.
2. SEE SC-1 FOR EROSION AND SEDIMENT CONTROL NOTES AND DETAILS.
3. ALL TREES ARE DEER RESISTANT.

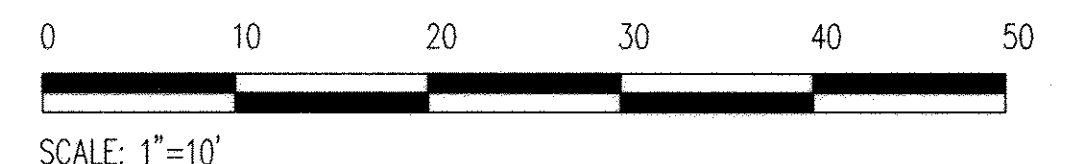
SYMBOLS



REMOVAL NOTES

- 1 REMOVE EXISTING BUSH/SHRUBS
- 2 REMOVE EXISTING 6" WHITE PINE TREE
- 3 REMOVE TWO (2) EXISTING 18" WHITE PINE TREES

GRAPHIC SCALE



PROFESSIONAL CERTIFICATION.
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33925, Expiration Date 1/15/15

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 10/22/14
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 10/22/14
CHIEF, BUREAU OF UTILITIES DATE

[Signature] 10/22/14
CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 10/22/14
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10/15/14

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CHK: SEA			
DATE: 10/20/14	BY: NO.	REVISION	DATE

CIVIL - LANDSCAPE PLAN AND DETAILS

1000 SCALE MAP NO. 32 BLOCK NO.20

ELKRIDGE PUMP STATION IMPROVEMENTS

HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

C-2
SCALE AS SHOWN
SHEET 3 OF 21

AS BUILT

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF

ELEVATION

CROSS SECTION

JOINING TWO ADJACENT SILT FENCE SECTIONS (TOP VIEW)

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION
--	------	---

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF

CONSTRUCTION SPECIFICATIONS

- USE WOOD POSTS 1 1/2 x 1 1/2 x 1/4 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD, AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
- USE 3/8 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
- USE WOVEN SILT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
- PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
- EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
- WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
- EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
- REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION
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DETAIL B-4-6-A TEMPORARY SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL: TSSMC - * 1b/ft² (* INCLUDE SHEAR STRESS)

ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

- USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
- USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOULDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
- SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 1/2 INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1 1/2 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
- PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
- UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTERLINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MAT SMOOTHLY AND FIRMLY ON THE SEEDBED SURFACE. AVOID STRETCHING THE MATTING.
- KEY-IN UPSTREAM END OF EACH MAT ROLL BY DIGGING A 6 INCH (MINIMUM) TRENCH AT THE UPSTREAM END OF THE MATTING, PLACING THE ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END.
- OVERLAP OR ABUT THE ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
- STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
- ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION
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DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE

PROFILE

PLAN VIEW

CONSTRUCTION SPECIFICATIONS

- PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
- PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
- PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
- PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
- MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE. MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION
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PERMANENT SEEDING NOTES

(TO BE IN ACCORDANCE WITH 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.)

APPLY TO GRADED OR CLEARED AREAS NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE WHERE A PERMANENT LONG-LIVED VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES:

- PREFERRED - APPLY 2 TONS PER ACRES DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT.) AND 600 LBS PER ACRE 10-10-10 FERTILIZER (14LBS/1000 SQ FT.) BEFORE SEEDING. HARROW OR DISK INTO UPPER THREE INCHES OF SOIL AT TIME OF SEEDING, APPLY 400 LBS PER ACRE 30-0-0 UREAFORM FERTILIZER (8 LBS/1000 SQ FT.).
- ACCEPTABLE - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT.) AND 1000 LBS PER ACRE 10-10-10 FERTILIZER (23 LBS/1000 SQ FT.) BEFORE SEEDING. HARROW OR DISK INTO UPPER THREE INCHES OF SOIL.

SEEDING - FOR THE PERIODS MARCH 1 THRU APRIL 30, AND AUGUST 1 THRU OCTOBER 15, SEED WITH 60 LBS PER ACRE (1.4 LBS/1000 SQ FT.) OF KENTUCKY 31 TALL FESCUE. FOR THE PERIOD MAY 1 THRU JULY 31, SEED WITH 60 LBS KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS PER ACRE (.05 LBS/1000 SQ FT.) OF WEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 THRU FEBRUARY 28, PROTECT SITE BY: OPTION (1) 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. OPTION (2) USE SOD. OPTION (3) SEED WITH 60 LBS/ACRE KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS/ACRE WELL ANCHORED STRAW.

MULCHING - APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT.) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SQ FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ FT.) FOR ANCHORING.

MAINTENANCE - INSPECT ALL SEEDED AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

TEMPORARY SEEDING NOTES

(TO BE IN ACCORDANCE WITH 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.)

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: - APPLY 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT.).

SEEDING - FOR PERIODS MARCH 1 THRU APRIL 30 AND FROM AUGUST 15 THRU OCTOBER 15, SEED WITH 2-1/2 BUSHEL PER ACRE OF ANNUAL RYE (3.2 LBS/1000 SQ FT.). FOR THE PERIOD MAY 1 THRU AUGUST 14, SEED WITH 3 LBS PER ACRE OF WEEPING LOVEGRASS (.07 LBS/1000 SQ FT.). FOR THE PERIOD NOVEMBER 16 THRU FEBRUARY 28, PROTECT SITE BY APPLYING 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.

MULCHING - APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT.) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GAL PER ACRE (5 GAL/1000 SQ FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES 8 FT OR HIGHER, USE 348 GAL PER ACRE (8 GAL/1000 SQ FT.) FOR ANCHORING.

REFER TO THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR RATE AND METHODS NOT COVERED.

SEC SEQUENCE OF CONSTRUCTION

- OBTAIN GRADING PERMIT.
- LAYOUT ALIGNMENT AT SITE. (2 DAYS)
- INSTALL SEDIMENT CONTROL DEVICES AS SHOWN ON PLAN.
- EXCAVATE SITE FOR GENERATOR GRADE SLAB AND CONNECTION OF ELECTRICAL DUCTBANK?? BACKFILL AROUND FOUNDATION AND DUCTBANK TRENCH AND STABILIZE (45 DAYS).
- PERFORM FINAL GRADING, SEEDING AND LAND SCAPING (5-DAYS).
- PERFORM MACADAM WORK (1 DAY)
- CLEAN UP CONSTRUCTION SITE, DEMOBILIZE (2-DAYS).
- REMOVE SEDIMENT CONTROL DEVICES AFTER PERMISSION IS GRANTED BY THE SEDIMENT CONTROL INSPECTOR. (5 DAYS).

NOTE: THE SEC SEQUENCE OF CONSTRUCTION SHALL BE COORDINATED WITH THE ENTIRE PROJECT SCHEDULE.

BEST MANAGEMENT PRACTICE (BMP) NOTES

- NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100 YEAR FLOODPLAIN.
- PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100 YEAR FLOODPLAIN.
- DO NOT USE THE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACKFILL IS REQUIRED USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.
- PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NONTIDAL WETLANDS, NONTIDAL WETLANDS BUFFERS, WATERWAYS, OR THE 100 YEAR FLOODPLAIN.
- REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT MODIFICATION OF THE 100 YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
- RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR 100 YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
- ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), BARLEY (HORDEUM SP.), OATS (UNIOLA SP.) AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
- AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
- TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM:

USE 1 WATER: IN STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.

- STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAYS.
- CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

STANDARD SEDIMENT CONTROL NOTES

- A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION, 410 (313-1855).
- ALL VEGETIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT "MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL", AND REVISIONS THERETO.
- FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
 - 7 CALENDER DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1.
 - 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. I, CHAPTER 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
- ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL (SEC. B.15) FOR PERMANENT SEEDING, SOD, TEMPORARY SEEDING AND MULCHING. TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
- ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- SITE ANALYSIS:

TOTAL AREA OF SITE	N/A	ACRES
AREA DISTURBED	0.110	ACRES
AREA TO BE ROOFED OR PAVED	0.025	ACRES
AREA TO BE VEGETATIVELY STABILIZED	0.120	ACRES
TOTAL CUT	96	CU. YDS.
TOTAL FILL	44	CU. YDS.

 OFFSITE WASTE/BORROW AREA LOCATION: CONTRACTOR COORDINATE
- ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF THE DISTURBANCE.
- ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
- TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE (3) PIPE LENGTHS OR THAT WHICH CAN BE BACK FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.
- CONTRACTOR SHALL PLACE EXCAVATED MATERIALS ON UPHILL SIDE OF TRENCH AND PLACE SILT FENCE ON DOWNHILL SIDE OF TRENCH.

STORM WATER, SEDIMENT AND EROSION CONTROL REQUIREMENTS

BASED ON THE WORK AREA, UNDER ONE ACRE AND ADDITIONAL IMPERVIOUS AREA'S ARE BELOW 5000 SF. THERE ARE NO STORM WATER MANAGEMENT REQUIREMENTS. THE CUT IS BELOW 100 CU. YDS AND THE DISTURBANCE IS BELOW 5000 SF, THEREFORE NO COUNTY SEDIMENT AND EROSION CONTROL PERMITS ARE REQUIRED. BEST MANAGEMENT PRACTICES ARE DEFINED HEREWITHIN.

ENGINEER'S CERTIFICATION

I/WE CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY CONSERVATION DISTRICT.

Steven E. Anderson 11/12/2014
STEVEN E. ANDERSON DATE
KCI TECHNOLOGIES, INC
936 RIDGEBROOK RD.
SPARKS, MD 21152

PROFESSIONAL CERTIFICATION

I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 33926, Expiration Date 1/15/15

Steven E. Anderson
PROFESSIONAL ENGINEER
10/15/14

KCI TECHNOLOGIES
936 RIDGEBROOK ROAD
SPARKS, MD 21152
PHONE: (410) 316-7800
FAX: (410) 316-8117
WWW.KCI.COM

DES: JFW	JFW	AS-BUILT'S	12/22/14
DRN: JFW			
CHK: SEA			
DATE: 10/2014	BY: NO.	REVISION	DATE
		1000 SCALE MAP NO. 32	BLOCK NO. 20

CIVIL - EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

ELKRIDGE PUMP STATION IMPROVEMENTS

HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4783
ELECTION DISTRICT 1

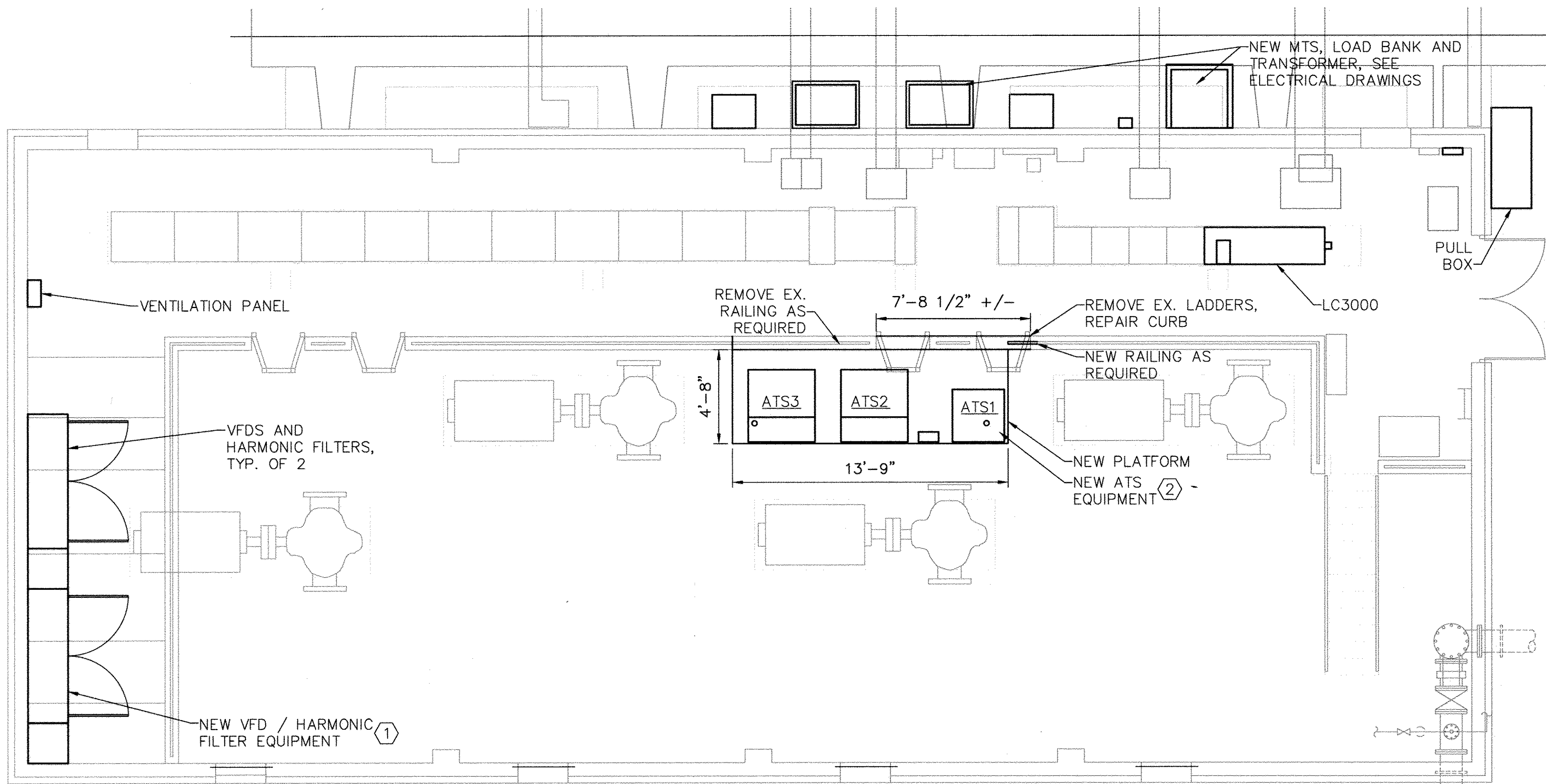
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James A. ... 10/24/14
DIRECTOR OF PUBLIC WORKS DATE

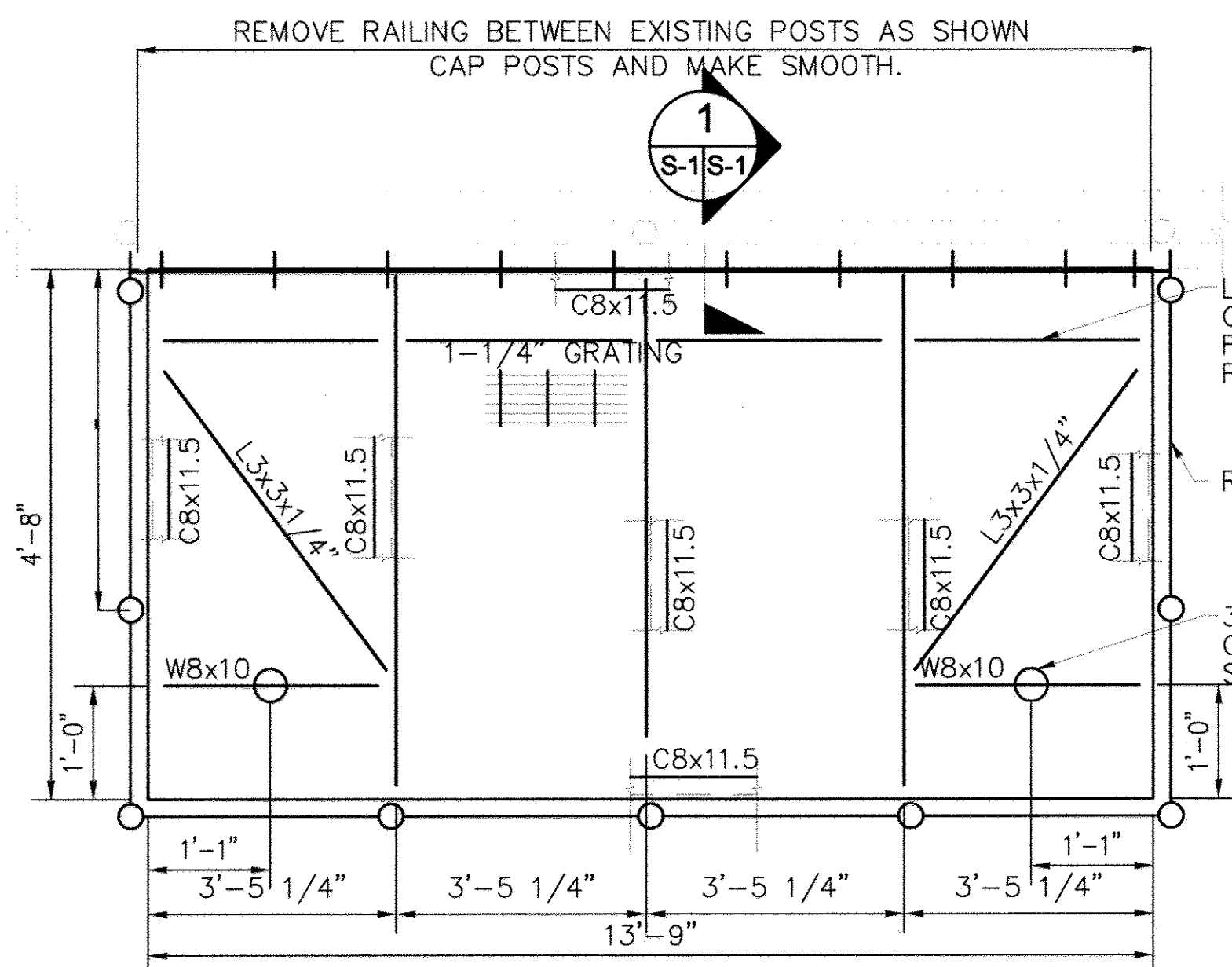
Thomas R. Butler 11/22/14
CHIEF, BUREAU OF UTILITIES DATE

Thomas R. Butler 11/22/14
CHIEF, UTILITY DESIGN DIVISION DATE

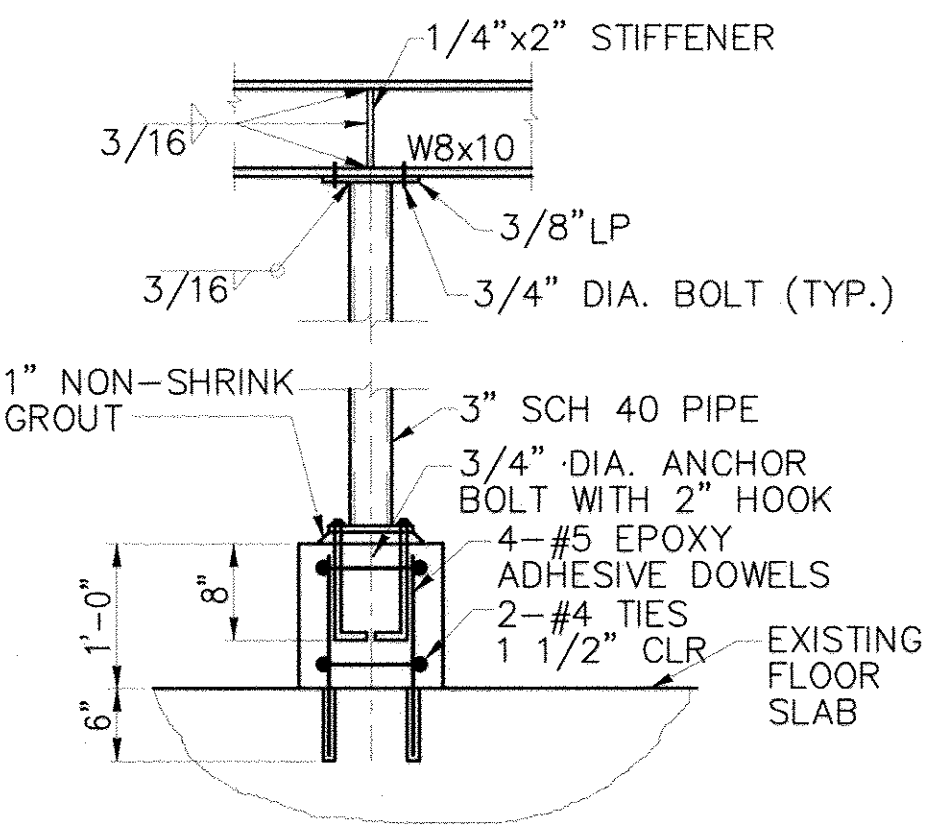
AS BUILT



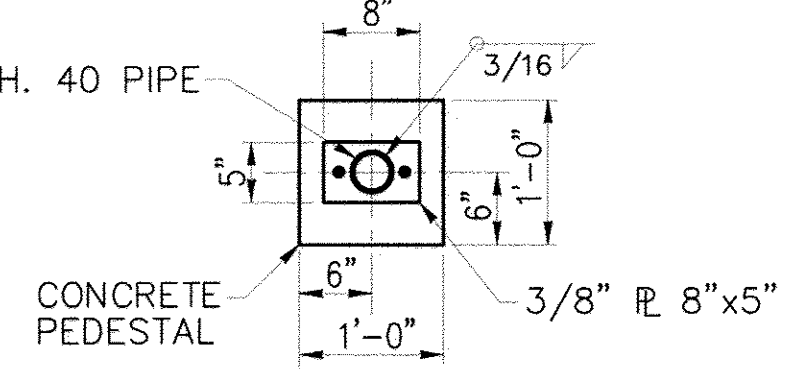
1 PLATFORM PLACEMENT PLAN
SCALE: 1/4" = 1'-0"



2 PLATFORM FRAMING PLAN
SCALE: NOT TO SCALE

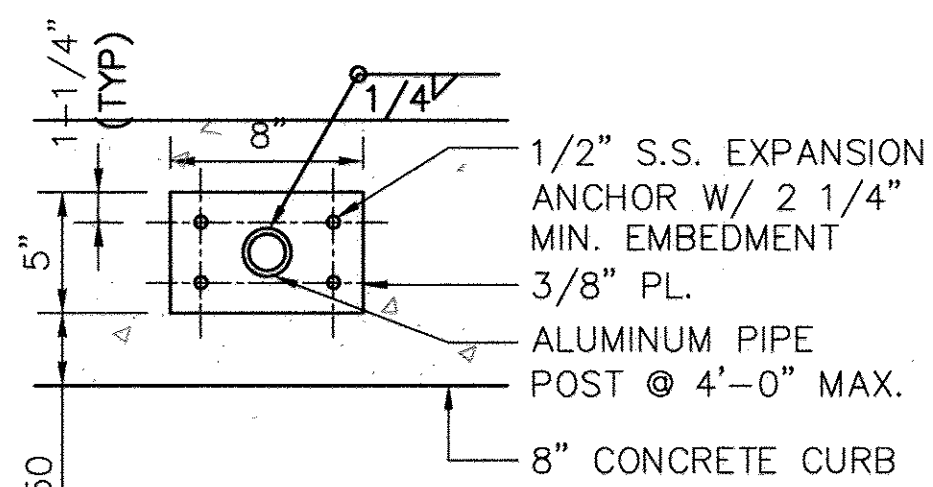


SECTION VIEW
SCALE: 3/4" = 1'-0"

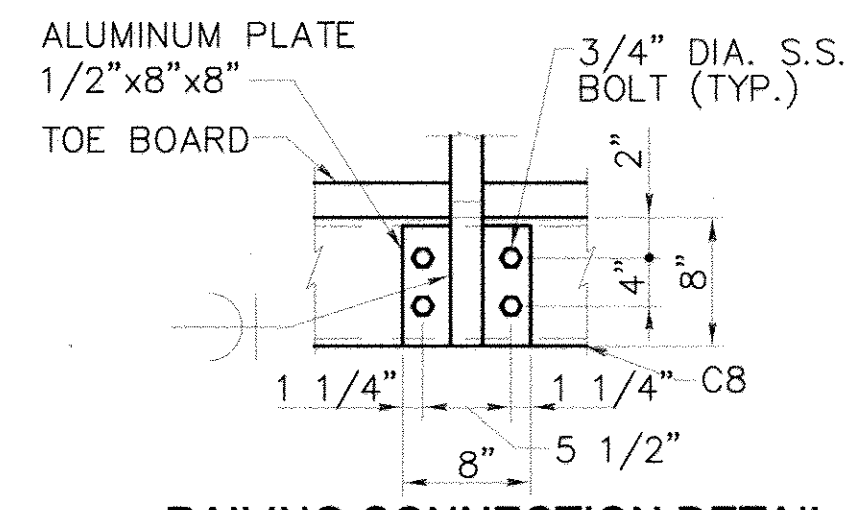


PLAN VIEW
SCALE: 3/4" = 1'-0"

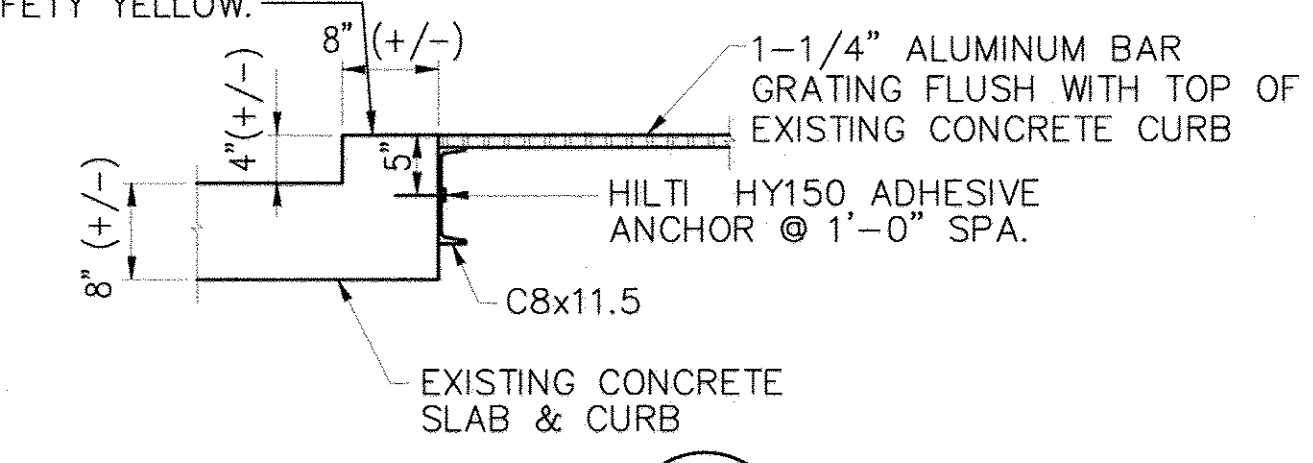
A TYPICAL PIPE COLUMN DETAIL
SCALE: AS NOTED



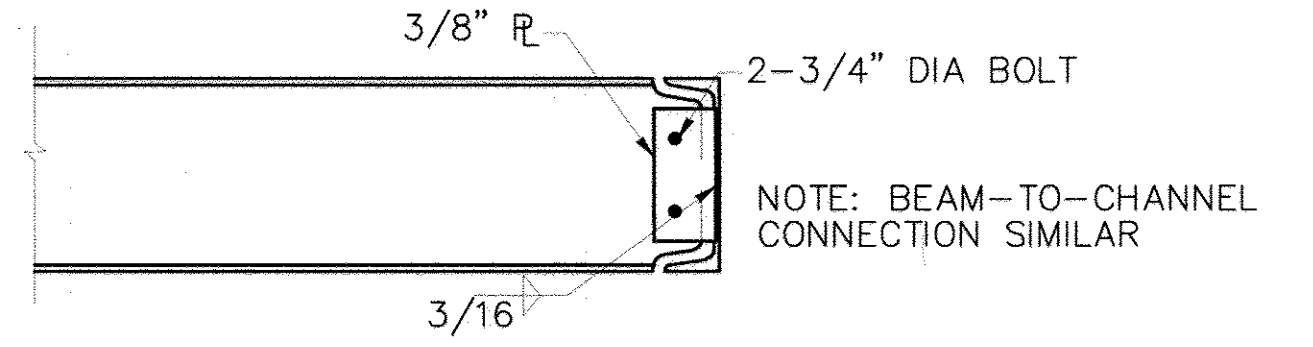
RAILING CONNECTION TO CONCRETE DETAIL
NOT TO SCALE



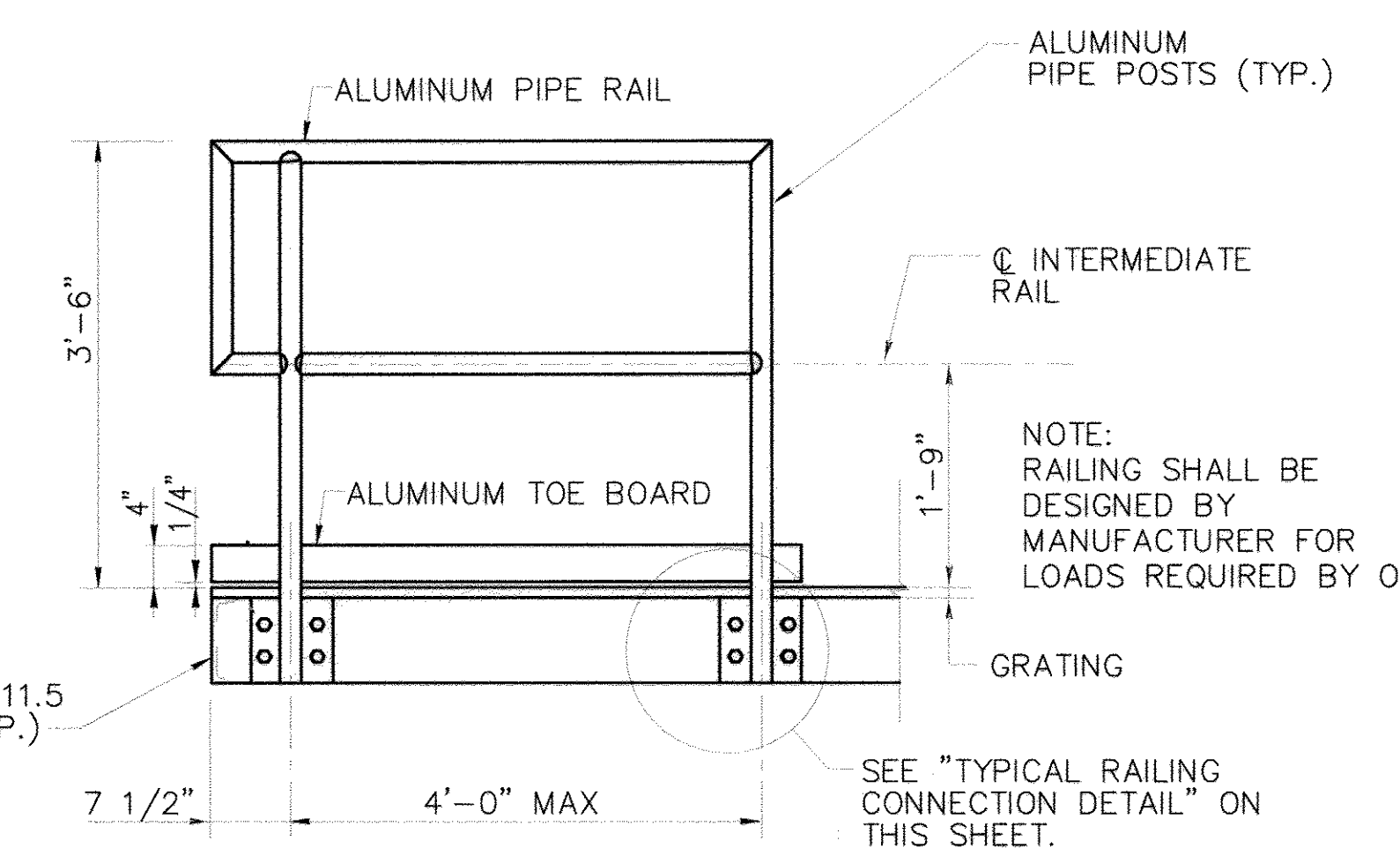
RAILING CONNECTION DETAIL
NOT TO SCALE



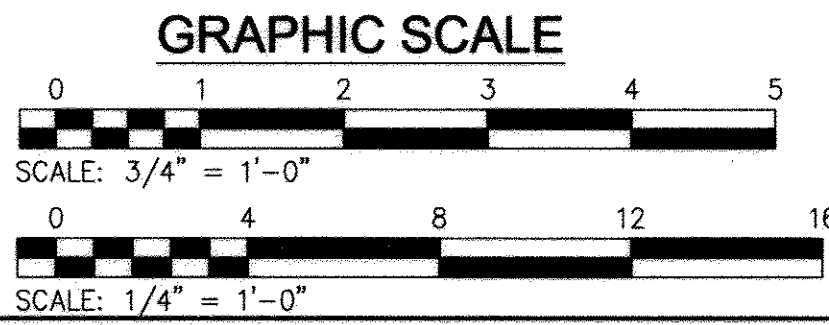
SECTION
SCALE: 3/4" = 1'-0"



TYP. CHANNEL-TO-CHANNEL CONNECTION DETAIL
NOT TO SCALE



TYP. RAILING DIMENSION
SCALE: 3/4" = 1'-0"



CONSTRUCTION NOTES

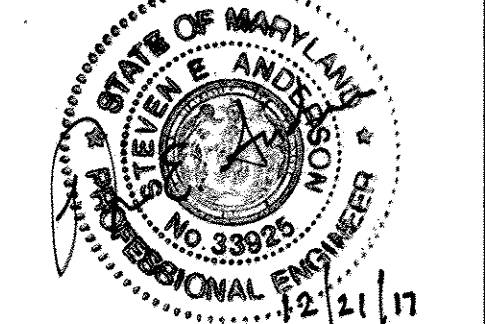
- COORDINATE MODIFICATIONS TO EXISTING SUPPORT STEEL TO SUIT NEW VFDS AND HARMONIC FILTERS.
- COORDINATE PLATFORM POST LOCATIONS TO MAINTAIN A MINIMUM OF 3- FEET CLEARANCE AROUND EQUIPMENT.

GENERAL NOTES

- DESIGN LOADS: GRATING LIVE LOAD = 125 PSF EQUIPMENT LOAD = 1560 LBS. EACH
- ALL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC MANUAL OF STEEL CONSTRUCTION (ALLOWABLE STRESS DESIGN), 9th EDITION. MATERIALS SHALL BE AS FOLLOWS: SHAPES AND PLATES: ASTM A 36 PIPE: ASTM A 53, GRADE B ASTM A 325 UNLESS SPECIFIED OTHERWISE BOLTS:
- ALL WELDING SHALL BE IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF AWS D1.1, STRUCTURAL WELDING CODE - STEEL, USING E70XX ELECTRODES. ALL WELDERS SHALL BE CERTIFIED IN ACCORDANCE WITH AWS REQUIREMENTS.
- ALL ALUMINUM GRATING SHALL HAVE 1-1/4"x1/8" BEARING BARS, IN ACCORDANCE WITH NAAMM METAL BAR GRATING MANUAL. EACH PANEL SHALL BE ANCHORED TO THE SUPPORT STRUCTURE WITH A MINIMUM OF 4 SADDLE CLIPS WITH 1/4" DIAMETER BOLTS OR SELF-DRILLING SCREWS.
- ALL STRUCTURAL STEEL, INCLUDING ALL BOLTS AND ACCESSORIES, SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A 123 AND A 153. ALL AREAS OF FIELD WELDING AND BOLTING AND ANY OTHER AREAS WITH DAMAGED COATING SHALL BE FIELD REPAIRED WITH SSPC PAINT 20 GALVANIZING REPAIR PAINT APPLIED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- ALL NEW HANDRAILING SHALL BE OF MODULAR ALUMINUM. SEE SPECIFICATIONS FOR PIPE SIZES AND LOADING QUALIFICATIONS.
- ALL DIMENSIONS AFFECTED BY THE GEOMETRICS AND/OR LOCATION OF THE EXISTING STRUCTURE ARE TO BE CHECKED IN THE FIELD BY THE CONTRACTOR BEFORE ANY CONSTRUCTION IS DONE AND BEFORE ANY MATERIAL IS ORDERED OR FABRICATED. NOTIFY THE ENGINEER WHERE OBSTRUCTIONS TO NEW CONSTRUCTION OCCUR BEFORE ANY CONSTRUCTION IS DONE AND BEFORE ANY MATERIAL IS ORDERED OR FABRICATED.
- SUBMIT SHOP DRAWINGS FOR ALL STEEL AND CONCRETE WORK TO OWNER PRIOR TO FABRICATION FOR APPROVAL.
- CONTRACTOR SHALL VERIFY THE LOCATION OF BUILDING STRUCTURAL ELEMENTS TO ASSURE THE CONSTRUCTABILITY OF THE PROPOSED STRUCTURE.
- CONTRACTOR IS RESPONSIBLE FOR CARRYING OUT THE PROJECT IN A SAFE MANNER SO THAT THE EXISTING STRUCTURE IS NOT DAMAGED IN ANY WAY. CONTRACTOR SHALL PERFORM ANY NECESSARY TESTING AND ENGAGE A QUALIFIED PROFESSIONAL TO PROVIDE CONSTRUCTION GUIDANCE. ANY DAMAGE TO THE EXISTING STRUCTURE CAUSED BY CONTRACTOR'S OPERATIONS SHALL BE REPAIRED TO THE OWNER'S SATISFACTION AT THE CONTRACTOR'S SOLE EXPENSE.
- ALL DETAILS ARE TYPICAL EXCEPT AS NOTED.
- CONCRETE:
 - ALL CONCRETE WORK SHALL CONFORM TO ALL PROVISIONS OF "SPECIFICATION FOR STRUCTURAL CONCRETE FOR BUILDINGS" (ACI 301) AND TO THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318).
 - ALL STRUCTURAL CONCRETE, UNLESS NOTED OTHERWISE, SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,500 P.S.I. AT 28 DAYS.
 - ALL REINFORCING BARS SHALL CONFORM TO ASTM A-615, GRADE 60.
 - HOOKS ON BARS SHALL HAVE STANDARD ACI LENGTHS AND BEND RADII UNLESS INDICATED OTHERWISE.
 - COVER FOR REINFORCEMENT SHALL BE IN ACCORDANCE WITH ACI 318 UNLESS INDICATED OTHERWISE.

PROFESSIONAL CERTIFICATION.
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33925, Expiration Date 1/15/19

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DES: LH	JFW	AS-BUILTS	12/22/2017
DRN: PDB			
CHK: LH			
DATE: 10/2014	BY	NO.	REVISION
			DATE

PLATFORM PLAN, DETAILS, SECTIONS, AND NOTES
1000 SCALE MAP NO. 32
BLOCK NO.20

ELKRIDGE PUMP STATION IMPROVEMENTS
HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

S-1
SCALE AS SHOWN
SHEET
5 OF 21

GENERAL ABBREVIATIONS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
ADDL	ADDITIONAL	GALV	GALVANIZED
AFF	ABOVE FINISHED FLOOR	GPM	GALLONS PER MINUTE
ALT	ALTERNATE	GS	GALVANIZED STEEL
ARV	AIR RELEASE VALVE	GST	GRAVITY SLUDGE THICKENER
BF	BLIND FLANGE	GV	GATE VALVE
BFV	BUTTERFLY VALVE	GWRV	GROUND WATER RELIEF VALVE
BLDG	BUILDING	H	HIGH/HEIGHT
BV	BALL VALVE	HORIZ	HORIZONTAL
CI	CAST IRON	HP	HIGH POINT/HORSE POWER
CL	CENTER LINE	HWA	HIGH WATER ALARM
CLR	CLEAR / CLEARANCE	HWL	HIGH WATER LEVEL
CONC	CONCRETE	ID	INSIDE DIAMETER
CONT	CONTINUOUS	IE	INVERT ELEVATION
CV	CHECK VALVE	IMC	INTERNATIONAL MECH. CODE
CV	CHEMICAL VAULT	INCR	INCREASER
D	DEEP/DEPTH	INV	INVERT
DIA	DIAMETER	JB	JUNCTION BOX
DIP	DUCTILE IRON PIPE	JC	JUNCTION CHAMBER
DWG	DRAWING	L	LONG / LENGTH
E	EAST / EASTING	LF	LINEAR FEET
ECC	ECCENTRIC	LP	LOW POINT
EF	EACH FACE	LWA	LOW WATER ALARM
EFF	EFFLUENT	LWL	LOW WATER LEVEL
EJ	EXPANSION JOINT	MAX	MAXIMUM
EL & ELEV	ELEVATION	MFR	MANUFACTURER
ELL	ELBOW	MG	MILLION GALLON
EQ	EQUALIZATION	MGD	MILLION GALLONS PER DAY
EW	EACH WAY	MIN	MINIMUM
EXIST	EXISTING	MJ	MECHANICAL JOINT
FCA	FLANGED COUPLING ADAPTER	N	NORTH / NORTHING
FCV	FLOW CONTROL VALVE	NC	NORMALLY CLOSED
FF	FINISH FLOOR	NGVD	NATIONAL GEODETIC VERTICAL DATUM
FH	FIRE HYDRANT	NPT	NATIONAL PIPE THREAD
FIN	FINISH	NTS	NOT TO SCALE
FLG	FLANGE	OC	ON CENTER
FLR	FLOOR	PE	PLAIN END
FM	FORCEMAIN	PRV	PRESSURE REDUCING VALVE
FPM	FEET PER MINUTE	PS	PUMINGP STATION
FRP	FIBERGLASS REINFORCED PLASTIC	PSI	POUNDS PER SQUARE INCH

FLOWSTREAM ABBREVIATIONS

SYMBOL	DESCRIPTION
AHP	AIR HIGH PRESSURE
ALP	AIR LOW PRESSURE
BX	BIOXIDE
CA	CITRIC ACID
CL2	CHLORINE
CW	COLD WATER
D	DRAIN
DG	DIGESTER GAS
DS	DIGESTED SLUDGE
DW	DILUTING WATER
FCH	FERRIC CHLORIDE
FW	FLUSHING WATER
G	GAS
GS	GRIT SLURRY
HW	HOT WATER
IR	INTERNAL RECYCLE
IMLR	INTERNAL MIXED LIQUOR RECYCLE
ML	MIXED LIQUOR
NAOH	SODIUM HYDROXIDE
NPW	NON POTABLE WATER
OVF	OVERFLOW
PCE	PRIMARY CLARIFIER EFFLUENT
PEF	PLANT EFFLUENT
PER	PERMEATE
P	POLYMER
PS	PRIMARY SLUDGE
PW	POTABLE WATER
RAS	RETURN ACTIVATED SLUDGE
RD	ROOF DRAIN
RS	RAW SEWAGE
SC	SCUM
S	SANITARY DRAIN OR SEWER
SEP	SEPTAGE
SHC	SODIUM HYPOCHLORITE
SSC	SECONDARY SCUM
SW	SEAL WATER
TD	TANK DRAIN
TS	THICKENED SLUDGE
TWAS	WASTE ACTIVATED SLUDGE
UW	UTILITY WATER
WAS	WASTE ACTIVATED SLUDGE

HVAC ABBREVIATIONS

SYMBOL	DESCRIPTION
B	BELT DRIVE
BBD	BACKDRAFT DAMPER
BTUH	BRITISH THERMAL UNITS PER HOUR
C	CELSIUS
CB	CENTRIFUGAL BLOWER
CE	CEILING EXHAUST
CFM	CUBIC FEET PER MINUTE
D	DIRECT DRIVE
EA	EXHAUST AIR
EDB	ENTERING DRY BULB TEMPERATURE
EWB	ENTERING WET BULB TEMPERATURE
F	FAHRENHEIT
FPM	FEET PER MINUTE
FRC	FILTERED RETURN GRILLE
GDB	GRAVITY DAMPER, COUNTER-BALANCED
I	INLINE
IA	INLINE AXIAL
IC	INLINE CENTRIFUGAL
KW	KILOWATT
LDB	LEAVING DRY BULB TEMPERATURE
LWB	LEAVING WET BULB TEMPERATURE
MBH	THOUSANDS OF BRITISH THERMAL UNITS PER HOUR
MOD	MOTOR OPERATED DAMPER
P	PROPELLER, WALL MOUNTED
RA	RETURN AIR
RD	RETURN DIFFUSER
RE	ROOF EXHAUST
RG	RETURN GRILLE
SA	SUPPLY AIR
SD	SUPPLY DIFFUSER
SG	SUPPLY GRILLE

PLUMBING ABBREVIATIONS

SYMBOL	DESCRIPTION
BFP	BACKFLOW PREVENTER
C.O.	CLEAN OUT
CW	COLD WATER
ES	EMERGENCY SHOWER
EW	EMERGENCY EYEWASH
EW/ES	EMERGENCY EYEWASH & SHOWER
FD	FLOOR DRAIN
FCO	FLOOR CLEAN OUT
HB	HOSE BIB
HD	HUB DRAIN
HR	HOSE RACK
HRL	HOSE REEL
HV	HOSE VALVE
HW	HOT WATER
NFWH	NON FREEZE WALL HYDRANT
RD	ROOF DRAIN
SP	SUMP PUMP
SPD	SUMP PUMP DISCHARGE
TD	TRENCH DRAIN
TW	TEMPERED WATER
VTR	VENT THROUGH ROOF

MECHANICAL GENERAL NOTES:

- COORDINATE ALL SHUTDOWNS AND SEQUENCING WITH THE OWNER.
- OWNER WILL MAINTAIN AND OPERATE EXISTING EQUIPMENT. CONTRACTOR SHALL NOT OPERATE EXISTING VALVES OR EQUIPMENT.
- UNLESS OTHERWISE NOTED, ITEMS ARE NEW UNLESS CALLED OUT AS EXISTING.
- COORDINATE ALL WORK TO AVOID EQUIPMENT CLEARANCE ISSUES.
- CHECK ALL DIMENSIONS OF EXISTING CONSTRUCTION WHICH AFFECT NEW WORK.
- STRUCTURE ELEVATIONS PROVIDED FOR CLARITY. SEE STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR FF ELEVATIONS AND FLOOR SLOPE.
- COORDINATE HATCH LOCATIONS, GRATING AND CLEAR OPENINGS TO SUIT EQUIPMENT REMOVAL.
- COORDINATE ALL PENETRATIONS WITH OTHER DISCIPLINES. ALL PENETRATIONS SHALL BE WATER TIGHT.
- UNLESS OTHERWISE NOTED, WALL PIPES AND SLEEVES SHALL HAVE A WATERSTOP POSITIONED IN THE CENTER OF THE WALL OR FLOOR. SEE TYPICAL DETAILS FOR CONFIGURATION. WALL PIPES AND SLEEVES SHALL BE INSTALLED AND PROPERLY SECURED PRIOR TO CONCRETE POUR.
- PIPING CONNECTIONS 3 INCH AND SMALLER HAVE BEEN SCHEMATICALLY SHOWN ON PLAN AND SECTION DRAWINGS. PROVIDE PIPE ROUTING AND ALL APPURTENANCES IN ACCORDANCE WITH RESPECTIVE SCHEMATICS. PROVIDE ALL NECESSARY FITTINGS TO MAKE CONNECTIONS. UNIONS, BUSHING AND/OR REDUCING INSERTS, ETC. NOT SHOWN ON DRAWINGS BUT REQUIRED FOR INSTALLATION SHALL BE FURNISHED AND INSTALLED.
- SCHEMATIC DRAWINGS SHOW PROCESS CONNECTIONS AND NOT SPATIAL ORIENTATION.
- THE SIZE OF THE PIPE CONNECTIONS AT THE PROCESS EQUIPMENT ARE SHOWN TO DEMONSTRATE INTENT. SIZES MAY VARY FROM WHAT IS SHOWN. COORDINATE THE SIZE OF CONNECTIONS TO ALL APPROVED PROCESS EQUIPMENT.
- SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED.
- WHERE A GROOVED END COUPLING IS SHOWN, IT SHALL BE THE RIGID JOINT TYPE, UNLESS OTHERWISE SPECIFIED.
- WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE JOINED TO THE COUPLING ADAPTER.
- UNLESS OTHERWISE NOTED, MINIMUM SLOPE FOR DRAINS SHALL BE 1/4 INCH PER LINEAR FOOT.
- PROVIDE PROCESS PIPING DRAINS WHERE INDICATED AND AT THE FOLLOWING: LOW POINTS; FLOW METERS AND BETWEEN PUMP SUCTION AND DISCHARGE ISOLATION VALVES. PUMP DRAINS SHALL BE ON THE SUCTION SIDE OF CENTRIFUGAL PUMPS.
- UNLESS OTHERWISE NOTED, ECCENTRIC REDUCERS SHALL BE INSTALLED FLAT SIDE ON TOP.
- CONTRACTOR SHALL CONFIRM ALL VALVE OPERATORS ORIENTATION WITH ENGINEER.
- VALVES ARE NORMALLY OPEN (N.O.) UNLESS NOTED AS NORMALLY CLOSED (N.C.).
- COORDINATE THE LOCATION OF VALVE SUPPORTS SO THAT ACCESS TO THE VALVE BEARINGS IS NOT RESTRICTED.
- UNLESS OTHERWISE NOTED, ALL EQUIPMENT SHALL BE PROVIDED WITH A MINIMUM 4-INCH CONCRETE HOUSEKEEPING PAD SIZED TO SUIT EQUIPMENT.
- SUPPORTS AND HANGERS ARE ONLY SHOWN WHERE SPECIFIC TYPES OR LOCATIONS ARE REQUIRED. ADDITIONAL SUPPORTS AND HANGERS SHALL BE REQUIRED AS SPECIFIED.
- METAL FABRICATIONS WITH BURS, SHARP EDGES OR POSE A HAZARD SHALL BE MADE DULL/BLUNT OR SHALL BE PROVIDED WITH AN APPROPRIATE COVERING THAT SHALL MITIGATE AND DRAW ATTENTION TO THE HAZARD.
- ALL DUCTS, AIR HANDLERS, FANS AND FILTER BOXES SHALL BE SEALED IN ACCORDANCE WITH SECTION 603.9 OF THE IMC.

PROCESS PIPING SYMBOLS:

	DOUBLE LINE	SINGLE LINE
WELDED PIPING		
FLANGED PIPING (4" & LARGER)		
THREADED PIPE		
ELBOW UP		
ELBOW DOWN		
TEE UP		
TEE DOWN		
LATERAL UP		
LATERAL DOWN		
CONCENTRIC REDUCER		
ECCENTRIC REDUCER		
UNION		
PIPE CAP		

VALVE SYMBOLS

BACKFLOW PREVENTOR	
GATE VALVE	
CHECK VALVE	
BALL VALVE	
BUTTERFLY VALVE	
SOLENOID VALVE	
PRESSURE REDUCING VALVE	
PRESSURE RELIEF VALVE	
NEDDLE VALVE	
CONE VALVE	

EQUIPMENT SYMBOLS

SLIDE GATE	
SPRAY NOZZLE	
JET NOZZLE	
AIR DIFFUSERS	
DOUBLE DISK DIAPHRAGM PUMP	
CENTRIFUGAL PUMP	
PROPELLER PUMP	
HYBERLOID MIXER	
HYDRAULIC ACTUATOR	
MOTOR ACTUATOR	
HEAT TRACE	

ANNOTATION SYMBOLS

WATER SURFACE ELEVATION	
ONE WAY FLOW DIRECTION	
BOTH WAYS FLOW DIRECTION	

HVAC SYMBOLS

DUCT SIZE - RECTANGULAR (FIRST DIMENSION ON PLAN OR SECTION IS SIDE SHOWN)	
DUCT TRANSITION - FLAT ON BOTTOM	
DUCT TRANSITION - FLAT ON TOP	
DUCT TRANSITION - CIRCULAR TO RECTANGULAR	
FLEXIBLE CONNECTION AT FAN-INLET AND OUTLET	
RETURN OR EXHAUST AIR DUCT	
SUPPLY AIR DUCT	
SQUARE ELBOW WITH TURNING VANES	
EXHAUST FLOW ARROW	
SUPPLY FLOW ARROW	
MOTOR OPERATED DAMPER	
VOLUME DAMPER	
FIRE DAMPER	
THERMOSTAT-AIR CONDITIONING	
FREEZESTAT	
THERMOSTAT-HEATING	
THERMOSTAT-HEAT PUMP	
THERMOSTAT-VENTILATION HIGH TEMP	
THERMOSTAT-VENTILATION	
UNIT HEATER	

FIELD INSTRUMENT SYMBOLS

MAGNETIC FLOW METER	
PRESSURE SENSOR W/ PRESSURE DEVICES	
PRESSURE SWITCH	
PRESSURE INDICATOR	
FLOW TRANSMITTER	
LEVEL SENSOR	
LEVEL TRANSMITTER	
DISSOLVED OXYGEN SENSOR	

PROFESSIONAL CERTIFICATION.
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33925, Expiration Date 1/15/15

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STATE OF MARYLAND PROFESSIONAL ENGINEER
10/15/14

DES:	JFW	JFW	AS-BUILTS	12-22-17
DRN:	JFW			
CHK:	LP			
DATE:	10/20/14	BY:	NO.	REVISION

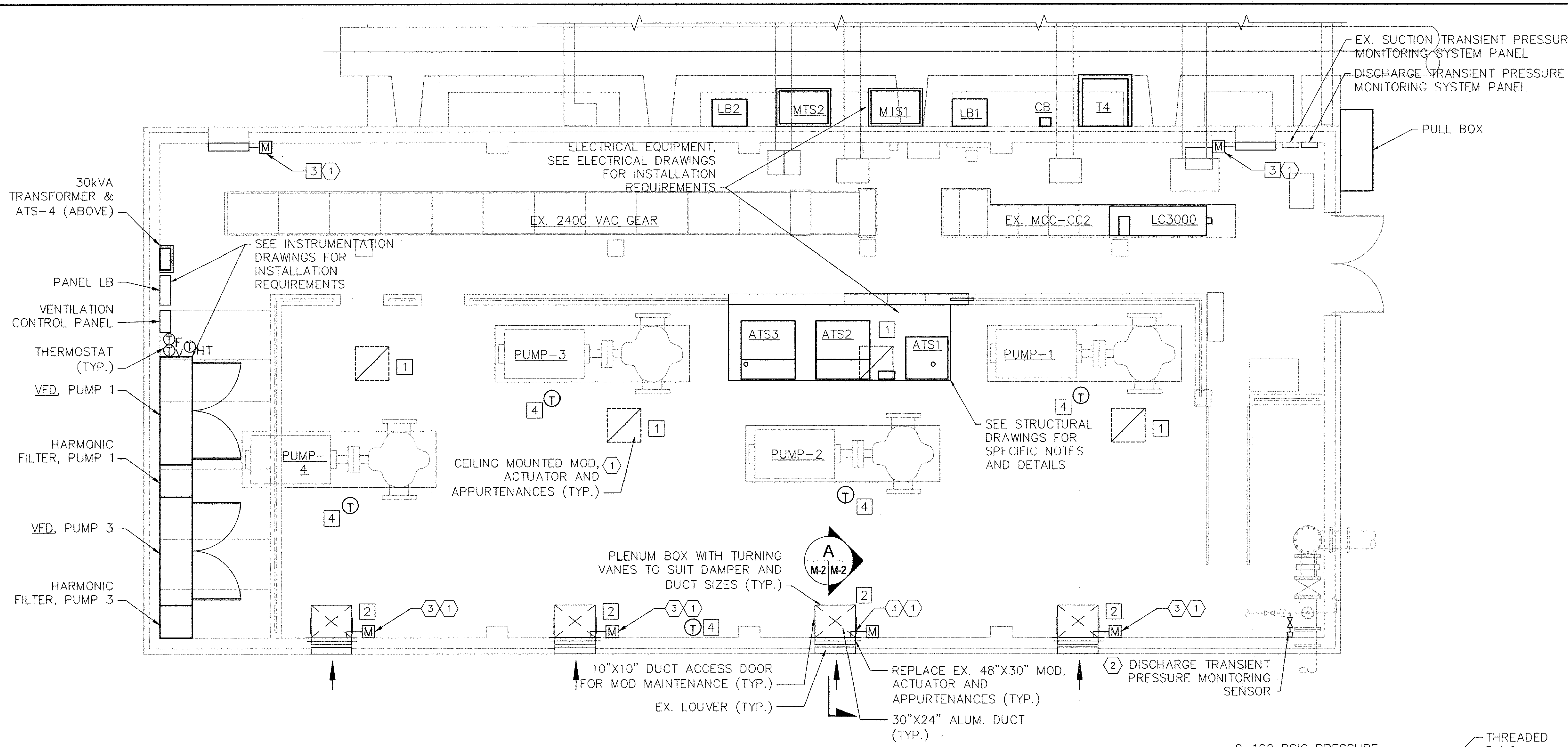
MECHANICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES	
1000 SCALE MAP NO. 32	BLOCK NO.20

ELKRIDGE PUMP STATION IMPROVEMENTS
HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

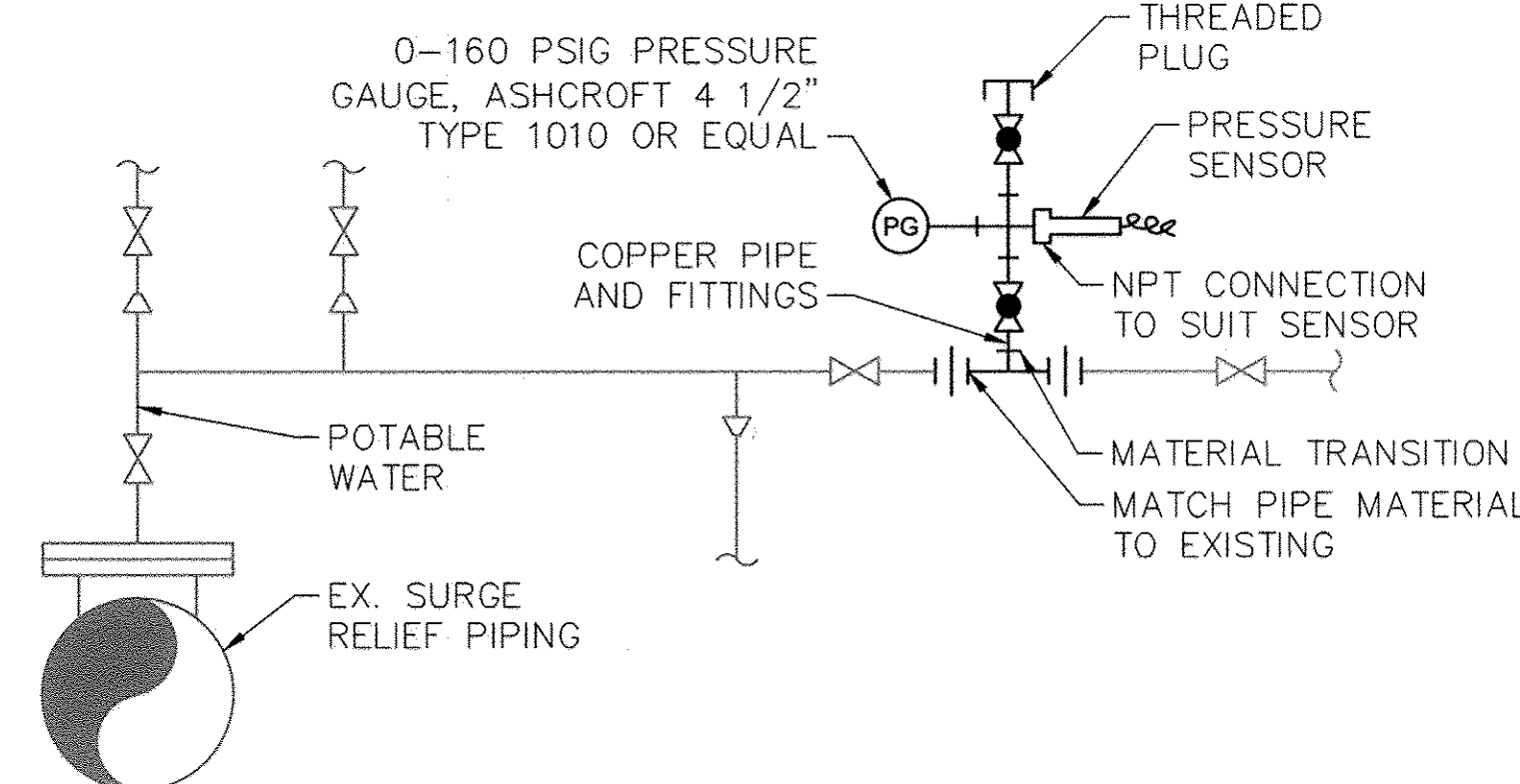
M-1
SCALE AS SHOWN
SHEET 6 OF 21

NOTE: THIS IS A STANDARD LEGEND AND ABBREVIATIONS SHEET. NOT ALL THE INFORMATION SHOWN ON THIS LEGEND IS USED ON THIS PROJECT.

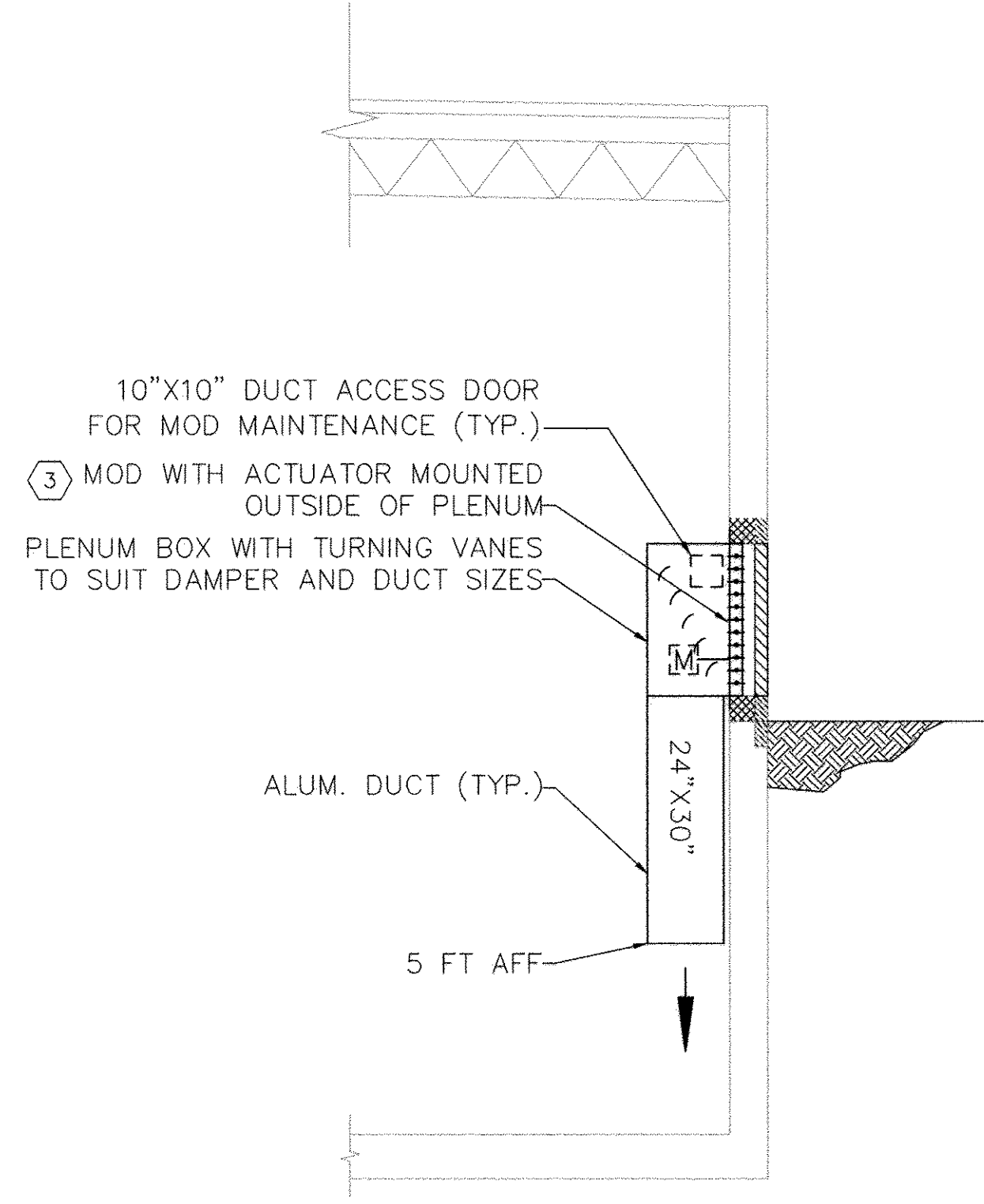
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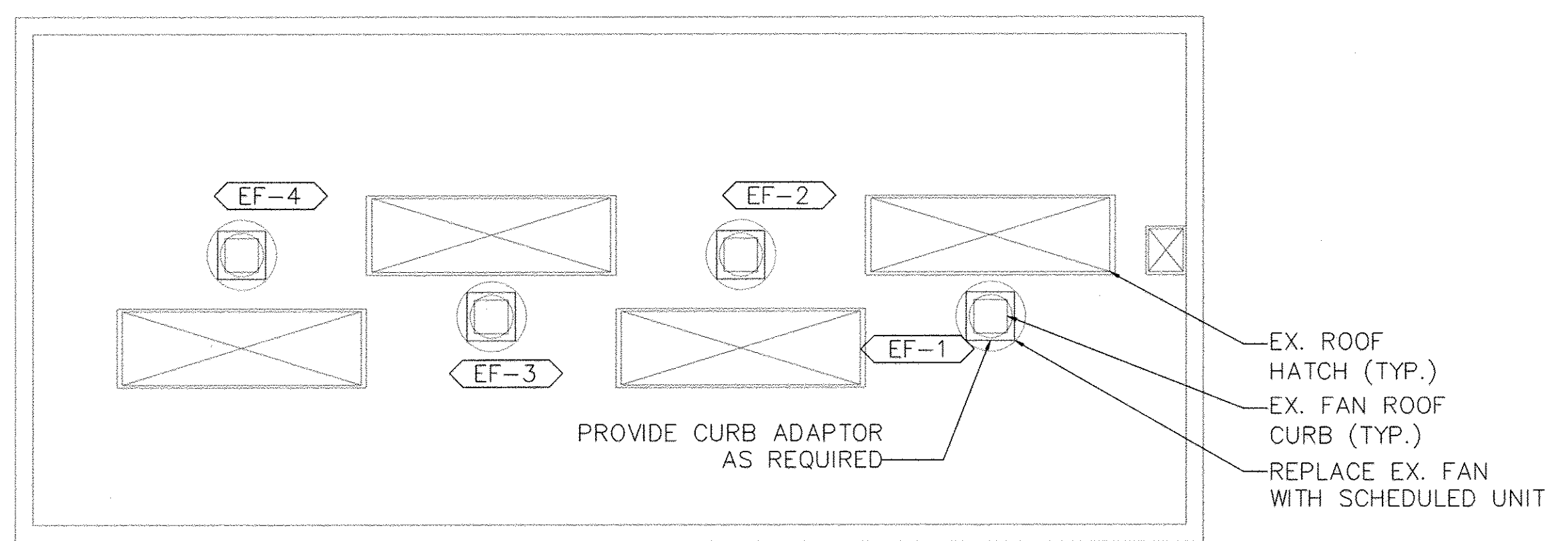
1 PUMP ROOM PLAN
 M-2 SCALE: 1/4" = 1'-0"



3 SENSOR DETAIL
 M-2 SCALE: NONE



A SECTION
 M-2 SCALE: 1/4" = 1'-0"

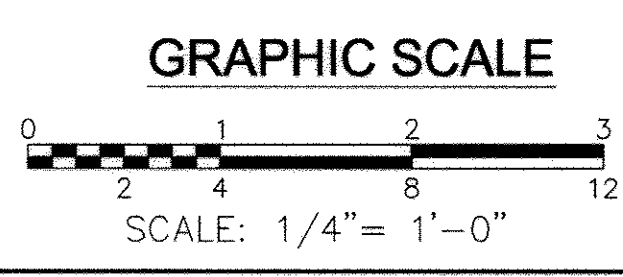


2 ROOF PLAN
 M-2 SCALE: NONE

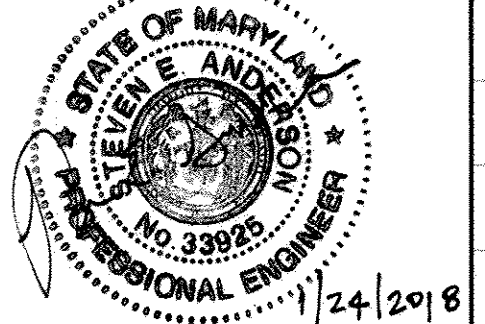
FAN SCHEDULE

ID	LOCATION	UNIT TYPE	TOTAL AIR (CFM)	ESP (IN WG)	MOTOR (HP)	RPM	DRIVE	VOLTS/PH/Hz	DAMPER	BASIS OF DESIGN	REMARKS
EF-1	ROOF	C,ROOF	8,375	0.5"	3	585	B	480/3/60	MOD	COOK 300 ACEB	Notes: 1
EF-2	ROOF	C,ROOF	8,375	0.5"	3	585	B	480/3/60	MOD	COOK 300 ACEB	Notes: 1
EF-3	ROOF	C,ROOF	8,375	0.5"	3	585	B	480/3/60	MOD	COOK 300 ACEB	Notes: 1
EF-4	ROOF	C,ROOF	8,375	0.5"	3	585	B	480/3/60	MOD	COOK 300 ACEB	Notes: 1

NOTES:
 1. PROVIDE ROOF CURB ADAPTOR AS REQUIRED.



PROFESSIONAL CERTIFICATION.
 I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33925, Expiration Date 1/15/19



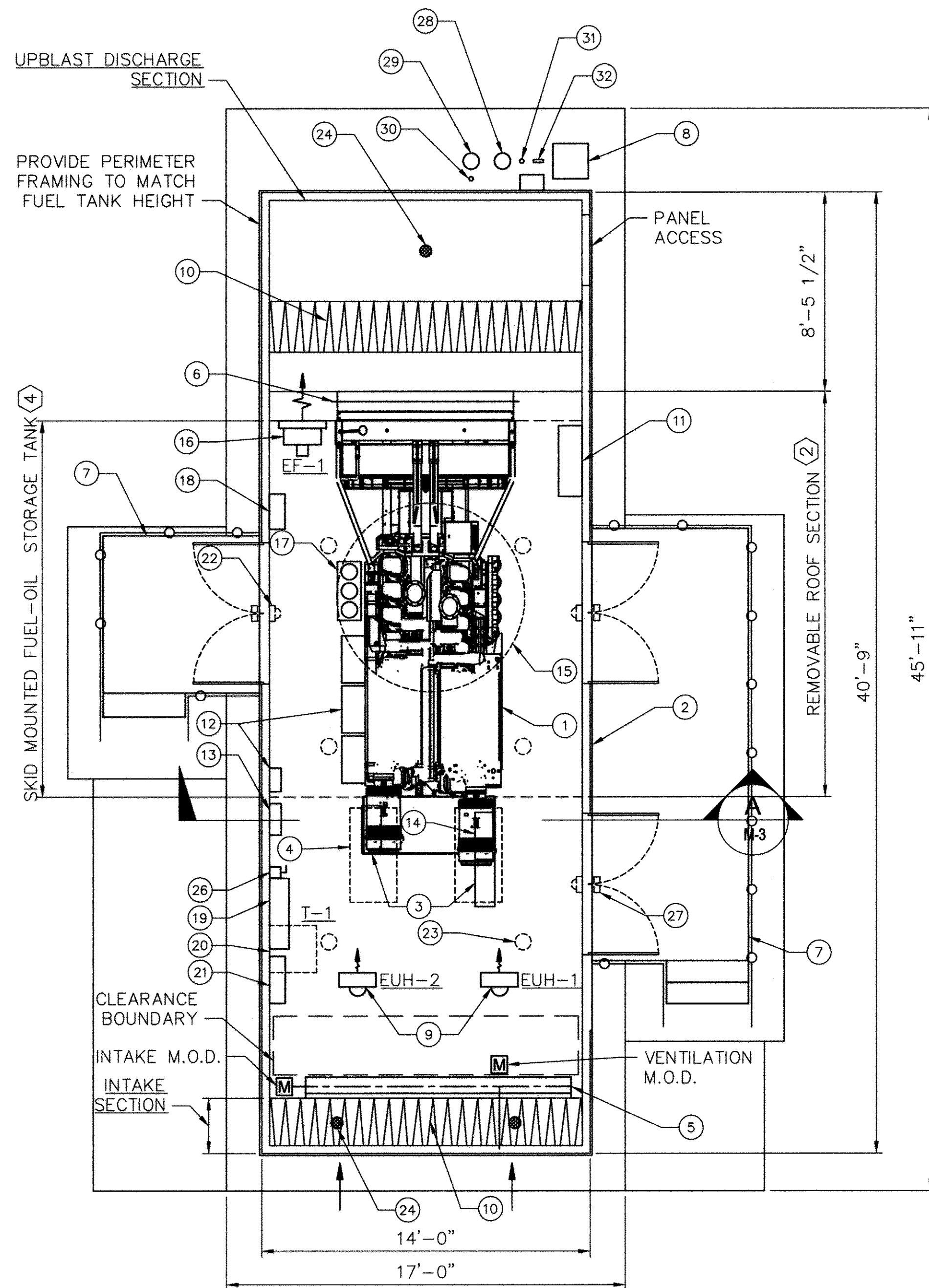
DES: MH	JFW	AS-BUILT	12/22/2017
DRN: JFW			
CHK: LAP			
DATE: 10/2014	BY: NO.	REVISION	DATE

MECHANICAL PLANS AND SCHEDULES
 1000 SCALE MAP NO. 32 BLOCK NO.20

ELKRIDGE PUMP STATION IMPROVEMENTS
 HOWARD COUNTY, MARYLAND
 CONTRACT NO. 44-4793
 ELECTION DISTRICT 1

M-2
 AS SHOWN
 SHEET
 7 of 21

KCI TECHNOLOGIES PROJECT No.: 13-12267718



1 GENERATOR ENCLOSURE LAYOUT
M-3 SCALE: 1/4" = 1'-0"

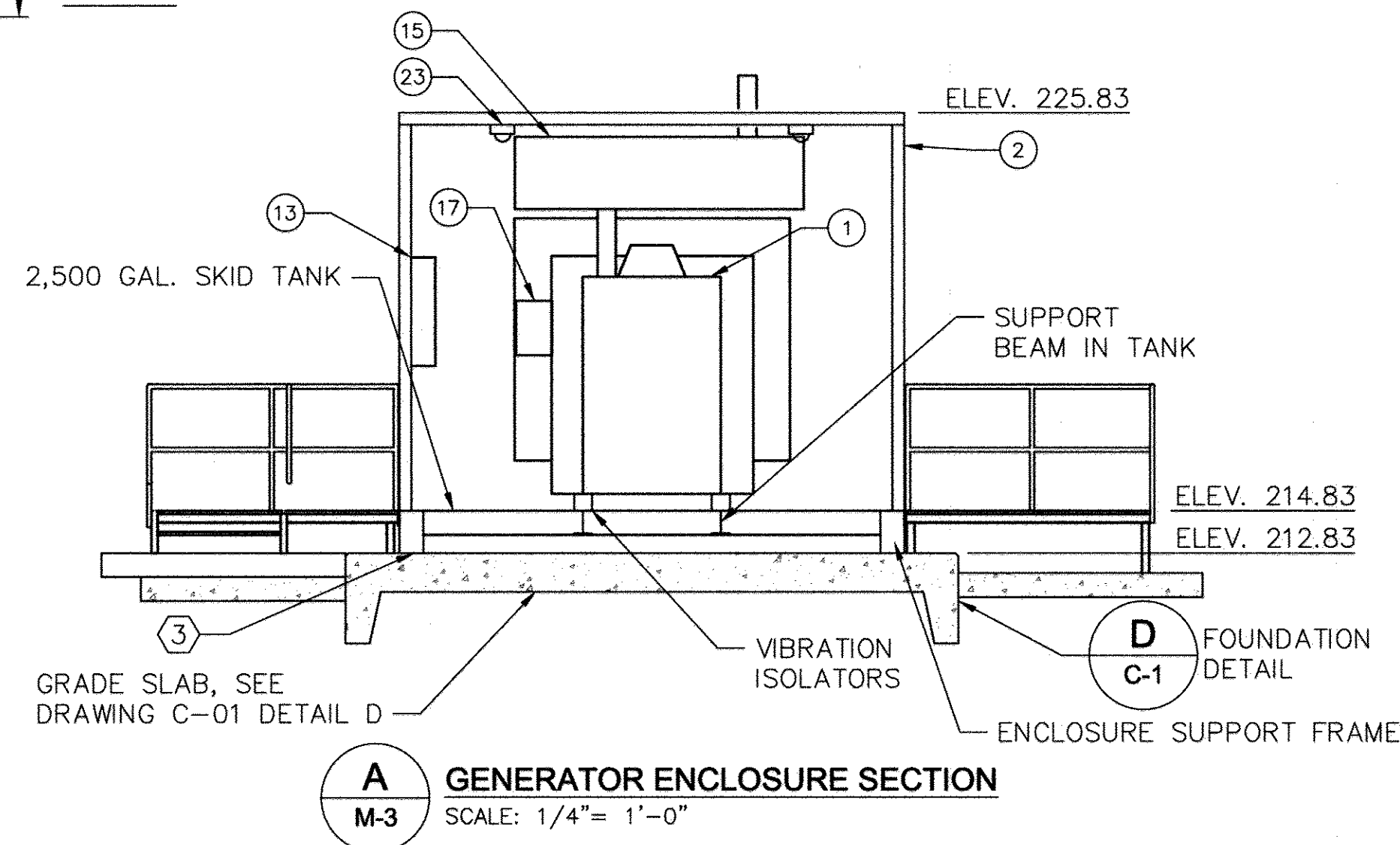
PLATFORM CRITERIA

MATL.	ALUMINUM
GRATING	ALUMINUM
HARDWARE	STAINLESS STEEL
HANDRAIL	ALUMINUM
LOADING	250 LBS/SF

NOTE:
PLATFORMS TO BE FURNISHED BY GENERATOR ENCLOSURE MANUFACTURER. PLATFORMS SHALL BE 8'x8' STRUCTURES INCLUDING STAIRWAY AND HANDRAIL. CONTRACTOR SHALL COORDINATE HEIGHT TO SUIT FINAL SETTING ELEVATION.

CODED NOTES

- 1 1250 kW GENERATOR
- 2 ACOUSTICAL GRADE LEVEL-2 ENCLOSURE W/ ROOF ACCESS HATCHES FOR EQUIPMENT REMOVAL
- 3 BREAKERS 800A, 800A, 400A
- 4 GENERATOR POWER / CONTROLS STUB-UP, (TYP. OF 2)
- 5 MOTORIZED INTAKE LOUVERS
- 6 RADIATOR DISCHARGE BACKDRAFT DAMPER OR M.O.D.
- 7 ENTRANCE PLATFORM (WITH REMOVABLE HANDRAILS)
- 8 FUEL-OIL DELIVERY POINT (OUTSIDE DOOR ACCESS)
- 9 5 kW ELECTRIC UNIT HEATER (EUH)
- 10 SOUND Baffles
- 11 FUEL-OIL POLISHING SYSTEM
- 12 BATTERY'S AND CHARGER
- 13 FUEL-OIL MONITORING SYSTEM
- 14 GENERATOR CONTROLER
- 15 CRITICAL GRADE SILENCER
- 16 EXHAUST FAN (PROPELLER BELT DRIVEN TYPE)
- 17 INJECTOR FUEL-PUMP FILTERING
- 18 VENTILATION CONTROL PANEL (VCP-1)
- 19 480 VAC POWER DISTRIBUTION PANEL
- 20 480 VAC - 208/120 VAC 75 KVA TRANSFORMER (MINIMUM)
- 21 208 / 120 VAC AUXILIARY SERVICE PANEL
- 22 EMERGENCY WALL PACK LIGHT (TYP. OF 3, BATTERY)
- 23 CEILING LIGHT FIXTURES (TYP. OF 6)
- 24 GENERAL PLENUM DRAINS
- 25 I&C TERMINATION ENCLOSURE
- 26 TRANSFORMER DISCONNECT
- 27 EXTERIOR LIGHTS, (TYP. OF 3)
- 28 8" EMERGENCY TANK VENT
- 29 8" EMERGENCY BASIN VENT
- 30 2" NORMAL TANK VENT
- 31 2" TANK SPARE PORT
- 32 FUEL LEVEL GAUGE



A GENERATOR ENCLOSURE SECTION
M-3 SCALE: 1/4" = 1'-0"

GENERATOR DESIGN CRITERIA

CAPACITY	1,250 kW
STANDARD kVA RATING	1,563 kVA
VOLTAGE	480 / 277 VAC, 3φ, 4W
EPA CLASSIFICATION	EMERGENCY, TIER 2 (65 DBA @ PROPERTY LINE COMPLIANCE) STANDBY
DUTY	ACoustical LEVEL-2 (WALK-IN)
ENCLOSURE	CRITICAL GRADE
EXHAUST SILENCER	V-16 CYLINDER
ENGINE SIZE	TURBOCHARGED
ASPIRATION	3,067 CUBIC INCHES
DISPLACEMENT	2,220 BHP
BRake HORSEPOWER	ENHANCED HIGH AMBIENT TYPE
COOLANT SYSTEM	92.5 GPH AT 100% LOAD
FUEL-OIL USE (MAX.)	2,500 GALLON (MIN. FOR 24 HOUR STORAGE)
SUB-BASE TANK	2-STAGE FILTERS, AFTER COOLER, AND POLISHING SYSTEM
FUEL AUXILIARIES	62,983 SCFM MIN. / 73,937 SCFM MAX.
SYSTEM AIR FLOW	ALTERNATOR (MAX. FRAME) 80°C TEMPERATURE RISE
ALTERNATOR (MAX. FRAME)	5,743 SkVA
MAXIMUM SURGE kVA	90% MIN. DURING STARTING
SUSTAINED VOLTAGE	

GENERATOR AIR FLOW DESIGN CRITERIA

AIR FLOW	
COMBUSTION AIR	4,460 SCFM
ALTERNATOR AIR	6,494 SCFM
RADIATOR COOLING	62,983 SCFM
	73,937 SCFM (MAX.)

INTAKE AIR

MAX. CORE VELOCITY	1,500 FPM
LOUVER	MOTORIZED
INTAKE SECTION	13' LONG (MAX.)
ACOUSTICS	BAFFLE WALL
FLOOR STYLE	DRAINABLE

EXHAUST AIR

ALTERNATOR AIR	6,494 SCFM
RADIATOR COOLING	62,983 SCFM
	69,477 SCFM (MAX.)

MAX. CORE VELOCITY	600 FPM
DAMPER	GRAVITY TYPE (SIZED TO SUIT RADIATOR)
DISCHARGE SECTION	12'-0" LONG (MAX.)
DISCHARGE PLENUM	11'-8"x13'-4" SCREENED
FLOOR STYLE	PLENUM DRAIN

GENERATOR AIR FLOW STATICS

MAXIMUM TOTAL STATICS 0.50-INCHES OF WATER (*)

(*) NOTE ACOUSTICAL ENCLOSURE DESIGN SHALL COMPLY WITH MANUFACTURERS "STATIC" REQUIREMENTS.

ENCLOSURE HEATING AND VENTILATION CRITERIA

VENTILATION

SERVICE AIR CHANGES	HEAT REMOVAL 15 AC.
FAN CAPACITY DEVICES	2,500 CFM
	MOTORIZED INTAKE LOUVER / INTEGRATED BACK-DRAFT DAMPER
FAN TYPE	PROPELLER
FAN RATINGS	2,500 CFM AT 0.375-INCHES OF WATER, BELT DRIVEN, 0.50 HP AT 961 RPM, 480 VAC, 3φ (EF-1)

HEATING

CAPACITY 5 kW, 480 VAC, 6 AMPS, 3φ (EUH-1)

VENTILATION CONTROL NARRATIVE

THE FAN SHALL BE THERMOSTATICALLY CONTROLLED WITH AN INTERLOCKED INTAKE LOUVER MOTOR ACTUATOR. THE FAN SHALL BE CONTROLLED FROM A VENTILATION CONTROL PANEL (VCP). THE PANEL SHALL INCLUDE A HAND-OFF-AUTOMATIC (HOA) SWITCH, RUN TIME METER, AND RUN/STOP INDICATIONS. THE PANEL SHALL BE COMPLETE WITH CONTROL POWER TRANSFORMER (CPT) SIZED FOR FAN CONTROLS AND MOTORIZED LOUVER LOADS.

1. **AUTOMATIC MODE:** WHEN THE HOA SELECTOR IS IN THE AUTOMATIC POSITION, THE FAN SHALL START AND STOP IN ACCORDANCE WITH THE ENCLOSURE THERMOSTAT SET-POINT. WHEN THE FAN IS CALLED TO RUN, THE MOTORIZED LOUVER SHALL BE INTERLOCKED TO OPEN. THE FAN SHALL NOT OPERATE IN AN OVERLOAD STATE, THE STARTER SHALL REQUIRE MANUAL RESET OF THE OVERLOAD CONDITION.
2. **HAND MODE:** WHEN THE HOA SELECTOR IS IN THE HAND POSITION, THE FAN SHALL RUN CONTINUOUSLY AS DESIRED. WHEN THE FAN IS CALLED TO RUN, THE MOTORIZED LOUVER SHALL BE INTERLOCKED TO OPEN. ALL ALARMS SHALL BE INDICATED LOCALLY AT THE VCP.

CONSTRUCTION NOTES:

- 1 MANUFACTURER COORDINATE LOCATIONS OF ALL EQUIPMENT DESCRIBED AND SPECIFIED TO SUIT CODE CLEARANCES AND MAINTENANCE OPERATIONS.
- 2 PROVIDE REMOVABLE ROOF SECTIONS TO FACILITATE OVER-HEAD CRANE WORK ON THE ENGINE AND RADIATOR SECTIONS OF THE GENERATOR.
- 3 CONTRACTOR SHALL ANCHOR THE ENCLOSURE IN ACCORDANCE WITH MANUFACTURE'S RECOMMENDATIONS.
- 4 THE ENCLOSURE SHALL BE COMPLETELY SUPPORTED ALONG THE PERIMETER FRAME TO THE GRADE SLAB. NO CANTILEVERED SECTIONS SHALL BE ACCEPTABLE.

ELECTRICAL POWER DISTRIBUTION SCHEDULE

480 VAC 3-PHASE, 4W (1)(3)

1. BLOCK HEATER-1
2. BLOCK HEATER-2
3. 5.0 KW UNIT HEATER
4. 1/2 HP. EXHAUST FAN
5. 208/120 VAC XFMR

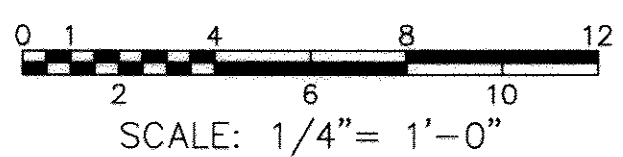
208/120 VAC (1)(3)

1. FUEL OIL POLISHING SYSTEM
2. BATTERY CHARGER
3. FUEL MEASUREMENT SYSTEM
4. INSIDE LIGHTING
5. EXTERIOR LIGHTING
6. RECEPTACLES

NOTES

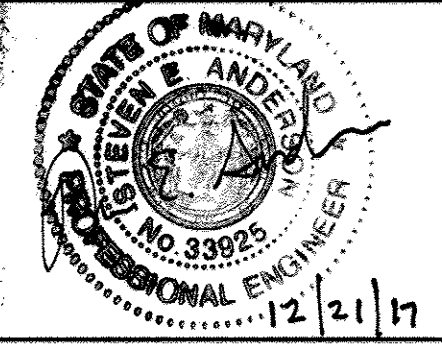
- (1) NOTE: GENERATOR MANUFACTURER COORDINATE ALL LOADS, AND POWER DISTRIBUTION WITHIN THE ENCLOSURE FOR A COMPLETE INTEGRATED PACKAGE.
- (2) ROOF HATCHES SHALL BE PROVIDED BY THE GENERATOR MANUFACTURER LOCATED OVER GENERATOR ENGINE ASSEMBLY AND ALTERNATOR.
- (3) SINGLE-PHASE AND THREE-PHASE CIRCUITS SHALL BE COORDINATED WITH SPECIFIC EQUIPMENT APPROVALS.

GRAPHIC SCALE



PROFESSIONAL CERTIFICATION.
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State Of Maryland, License No. 33925, Expiration Date 1/15/19

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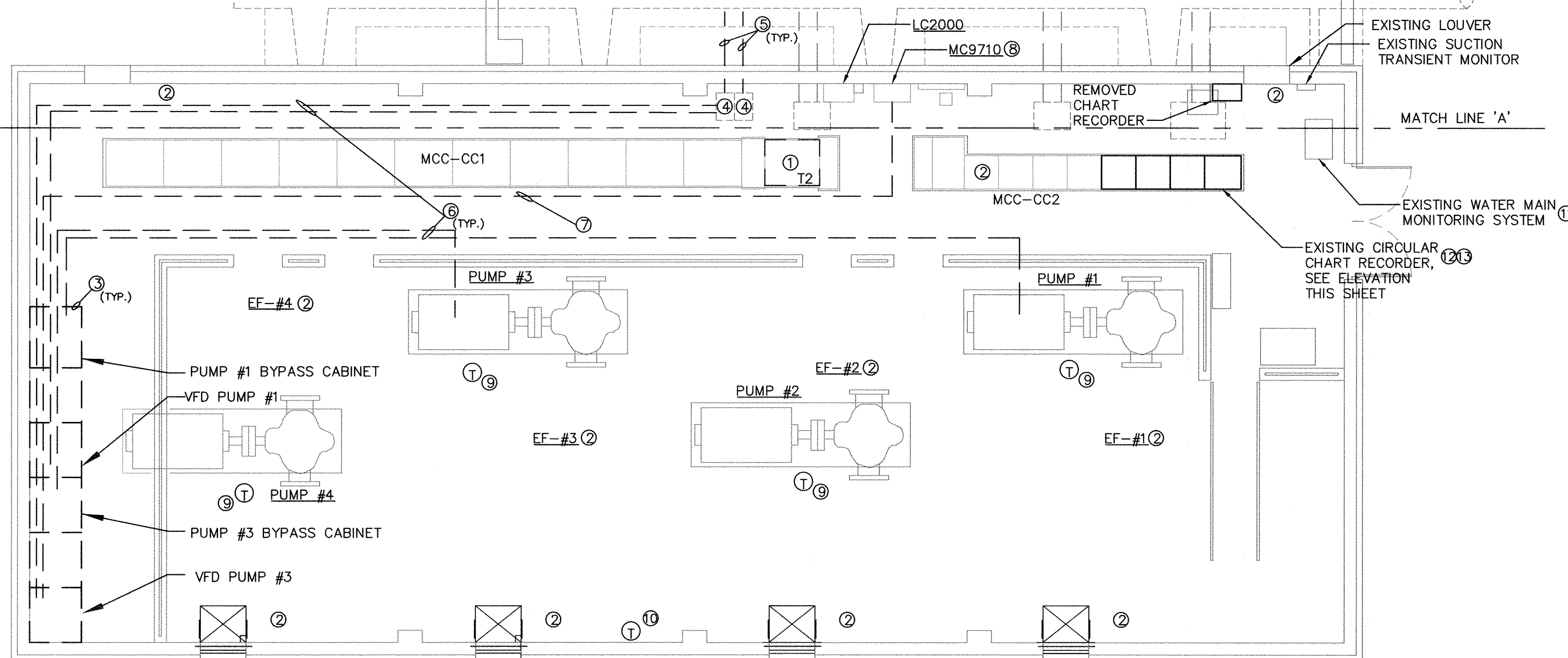
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DRN: JFW			
CHK: SEA			
DATE: 10/2014	BY NO.	REVISION	DATE

GENERATOR ENCLOSURE LAYOUT
1000 SCALE MAP NO. 32
BLOCK NO.20

ELKRIDGE PUMP STATION IMPROVEMENTS
HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

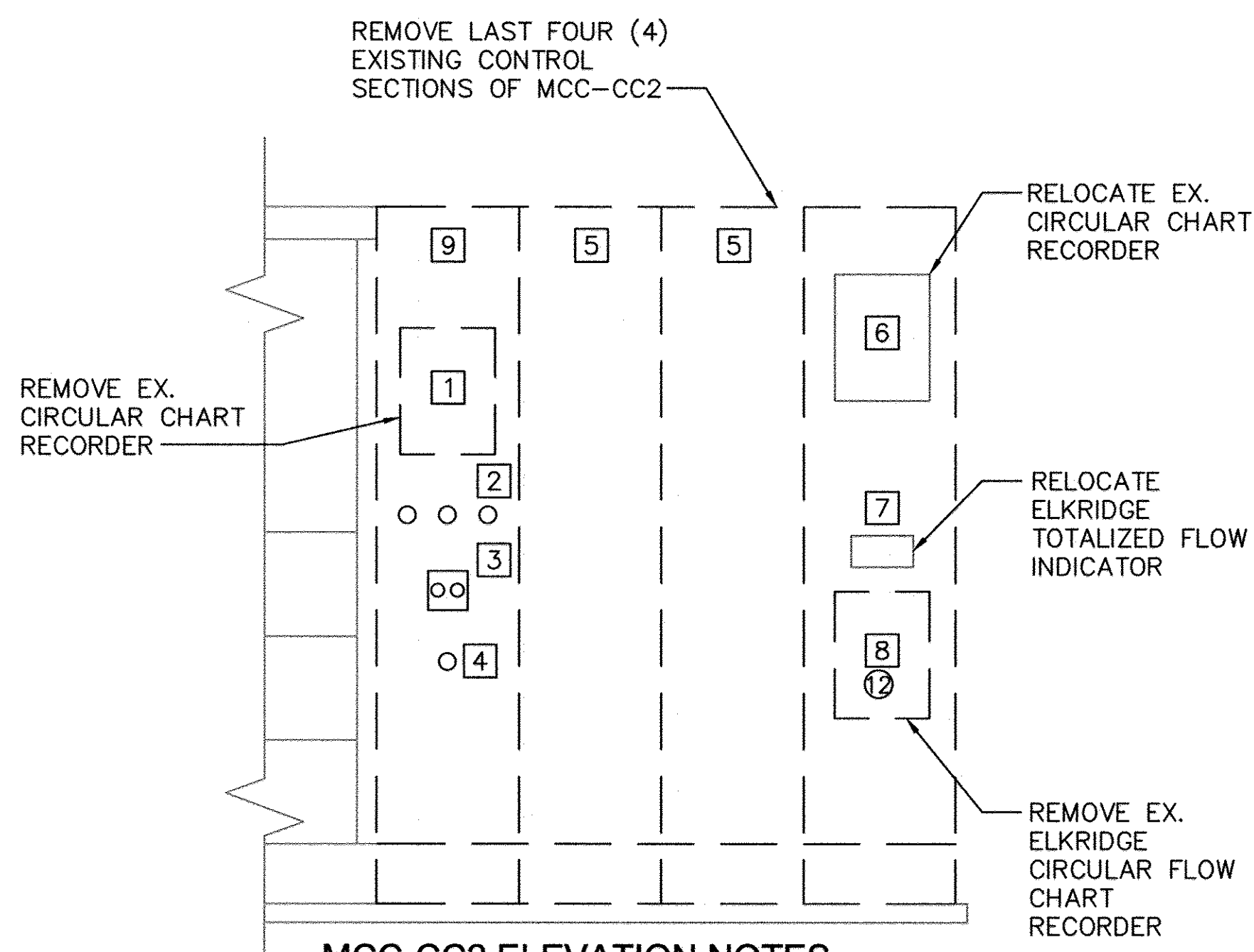
KCI TECHNOLOGIES PROJECT No.: 13-12267718

13-12267718-ED-1 - Pump Station Plan - .dwg



1 ELKRIDGE WATER PUMP STATION
ED-1 SCALE: 1/4" = 1'-0"

DEMOLITION TRANSFORMER SCHEDULE								
DESIGNATOR	PRIMARY VOLTAGE	PRIMARY CONFIGURATION	SECONDARY VOLTAGE	SECONDARY CONFIGURATION	RATING	MOUNTING STYLE	NEMA	BASIS OF DESIGN
T2	2.4KV	DELTA	480/277	WYE	150KVA	FLOOR	NEMA 1	



- MCC-CC2 ELEVATION NOTES**
- 1 REMOVE SNOWDEN TANK CIRCULAR CHART RECORDER.
 - 2 REMOVE LEAD/LAG SELECTOR SWITCHES.
 - 3 REMOVE FAILURE/RESET ALARM.
 - 4 REMOVE LEAD/LAG TROUBLE INDICATOR.
 - 5 REMOVE ABANDONED CONTROL SECTION.
 - 6 G.B. FOOD MARKET EWT LEVEL RECORDERS.
 - 7 ELKRIDGE TOTALIZED FLOW INDICATOR.
 - 8 ELKRIDGE FLOW CIRCULAR CHART RECORDER.
 - 9 REMOVE EXISTING CONTROL SECTION.

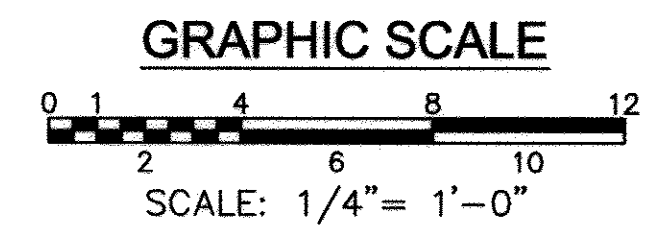
A PARTIAL ELEVATION: MCC-CC2
ED-1 SCALE: NONE

GENERAL NOTES

1. ARRANGE CONDUIT, WIRING, EQUIPMENT AND OTHER WORK GENERALLY AS SHOWN, PROVIDING PROPER CLEARANCE AND ACCESS. CAREFULLY EXAMINE ALL CONTRACT DRAWINGS AND COORDINATE THE WORK WITH ALL TRADES. WHERE DEPARTURES ARE PROPOSED BECAUSE OF FIELD CONDITIONS OR OTHER CAUSES, PREPARE AND SUBMIT DETAILED DRAWING FOR ACCEPTANCE.
2. THE CONTRACT DOCUMENTS ARE DIAGRAMMATIC, ALL OFFSETS, BENDS, FITTINGS AND ACCESSORIES ARE NOT NECESSARILY SHOWN. PROVIDE ALL SUCH ITEMS AS REQUIRED FOR COMPLETE OPERATIONAL SYSTEM.
3. CONTRACTOR SHALL ACCOMPANY THE OWNER FOR INSPECTION AND APPROVAL AT PROJECT COMPLETION.
4. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND CERTIFICATES OF INSPECTION AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION OVER THIS WORK.
5. CONTRACTOR TO CONTACT MISS UTILITY (1-800-257-7777) 48-HOURS PRIOR, EXCLUDING WEEKENDS AND HOLIDAYS, TO STARTING EARLY WORK. IT'S THE CONTRACTORS RESPONSIBILITY TO PROTECT EXISTING UNDERGROUND UTILITIES DURING CONSTRUCTION. REPAIRS TO DAMAGED UTILITIES SHALL BE MADE AT NO EXPENSE TO THE OWNER.
6. GROUND ELECTRIC SYSTEM IN ACCORDANCE WITH NEC SECTION 250.
7. 3/4" CONDUIT SHALL BE THE MINIMUM SIZE CONDUIT INSTALLED. ALL CONDUIT SHALL BE ALUMINUM, EXCEPT DUCT BANK WHICH IS PVC.
8. ALL NEW MATERIAL REQUIRED SHALL CONFORM WITH THE STANDARDS OF UNDERWRITERS LABORATORIES (UL).
9. ELECTRICAL CONTRACTOR SHALL PROVIDE TEMPORARY POWER TO SCADA SYSTEM FOR THE DURATION OF ALL PLANNED POWER OUTAGES.

REMOVAL NOTES

- 1 REMOVE EXISTING 150KVA TRANSFORMER, WIRING AND CONDUIT.
- 2 EF-1, EF-2, EF-3 AND EF-4: DISCONNECT POWER AND CONDUIT FROM EXISTING FANS AND MOD'S, REMOVE OVERLOADS. REUSE EXISTING CONDUIT TO THE EXTENT POSSIBLE. COORDINATE WITH MECHANICAL CONTRACTOR AND SYSTEM INTEGRATOR.
- 3 DISCONNECT AND REMOVE EXISTING VFDs, SSRVS AND POWER FACTOR FILTERS FOR PUMP #1 AND PUMP #3. REUSE CONDUIT TO THE EXTENT POSSIBLE.
- 4 REMOVE EXISTING JUNCTION BOXES (23" x 16" x 32" AND 23" x 22" x 32") BELOW MEZZANINE.
- 5 REMOVE CONDUCTORS FROM 2.4KV-480V STEP DOWN TRANSFORMERS AND EXISTING VFDs. REUSE CONDUIT TO THE EXTENT POSSIBLE.
- 6 REMOVE CONDUCTORS BETWEEN 2.4KV-480V TRANSFORMERS AND EXISTING VFDs. REMOVE CONDUCTORS BETWEEN EXISTING PUMPS #1 AND #3 AND VFDs. REUSE CONDUIT TO THE EXTENT POSSIBLE.
- 7 REMOVE INSTRUMENTATION CONDUCTORS BETWEEN VFDs AND MC9710. SEE INSTRUMENTATION DRAWINGS FOR DETAILED INTEGRATION REQUIREMENTS.
- 8 RETROFIT PANEL FOR TERMINAL BOARD INSTALL.
- 9 REMOVE EXISTING THERMOSTAT WIRING FROM DEVICE TO MCC-CC2.
- 10 REMOVE EXISTING THERMOSTAT WIRING FROM DEVICE TO PANEL-LA, CIRCUIT LA-10.
- 11 REMOVE POWER CIRCUITS TO EXISTING WATER MAIN MONITOR AND HYDRAULIC SUCTION TRANSIENT MONITOR.
- 12 REMOVE EXISTING ELKRIDGE STATION CIRCULAR FLOW CHART RECORDER IN MCC-CC2.
- 13 REMOVE THE LAST FOUR (4) EX. MCC SECTIONS FROM MCC-CC2, TWO (2) EMPTY 20" CABINETS, ONE (1) 20" CABINET WITH EX. CONTROLS AND ONE (1) 24" CABINET.



PROFESSIONAL CERTIFICATION
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STATE OF MARYLAND
LEWIS E. ANDERSON, III
PROFESSIONAL ENGINEER
No. 33925
1/16/2018

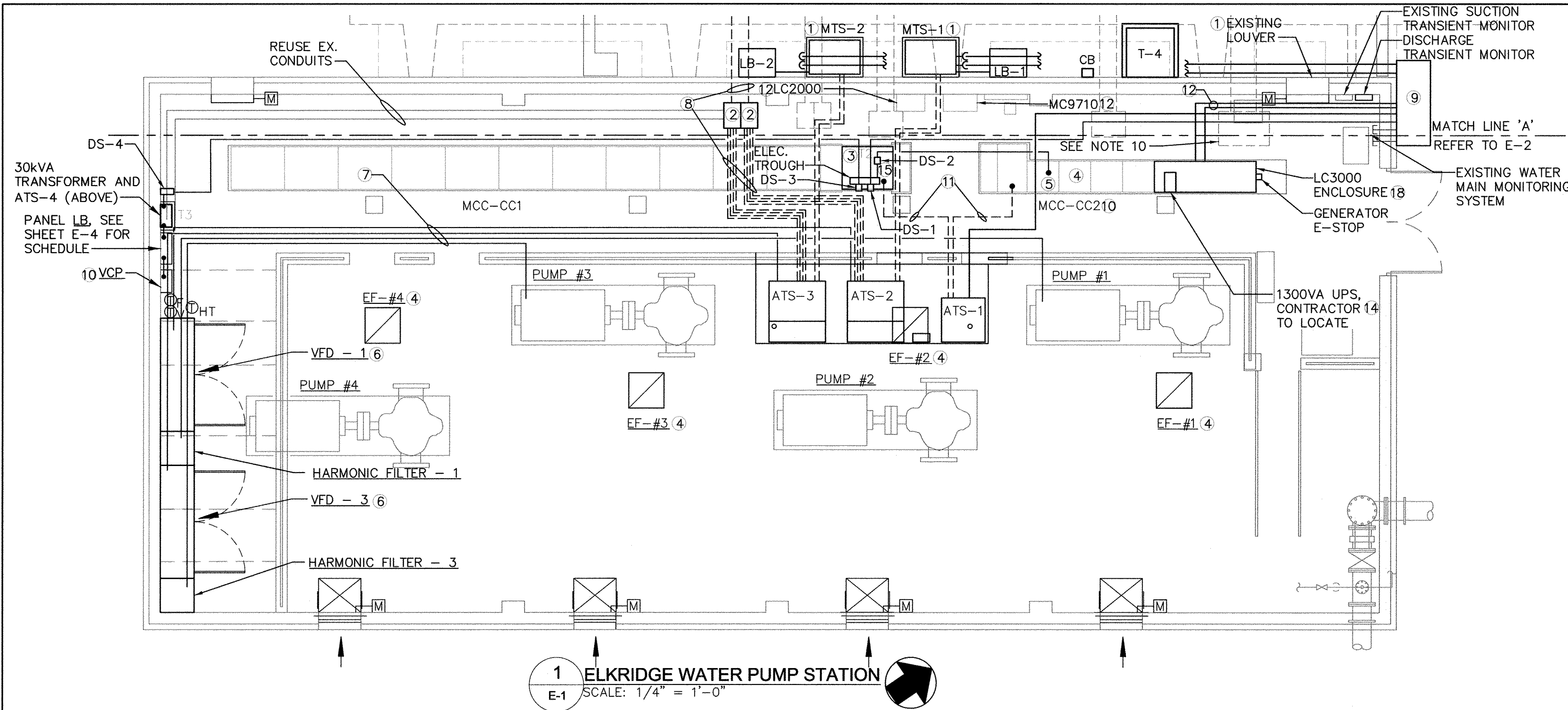
DES: SEB	JFW	AS-BUILT	12/22/2017
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CHK: RDS			
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ELECTRICAL - DEMOLITION PLAN	
PUMP STATION	
1000 SCALE MAP NO. 32	BLOCK NO.20

ELKRIDGE PUMP STATION IMPROVEMENTS
HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

SCALE AS SHOWN
SHEET 9 OF 21

KCI TECHNOLOGIES PROJECT No.: 13-12267718



1 ELKRIDGE WATER PUMP STATION
E-1 SCALE: 1/4" = 1'-0"

GENERAL NOTES

- ARRANGE CONDUIT, WIRING, EQUIPMENT AND OTHER WORK GENERALLY AS SHOWN, PROVIDING PROPER CLEARANCE AND ACCESS. CAREFULLY EXAMINE ALL CONTRACT DRAWINGS AND COORDINATE THE WORK WITH ALL TRADES. WHERE DEPARTURES ARE PROPOSED BECAUSE OF FIELD CONDITIONS OR OTHER CAUSES, PREPARE AND SUBMIT DETAILED DRAWING FOR ACCEPTANCE.
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- CONTRACTOR TO CONTACT MISS UTILITY (1-800-257-7777) 48-HOURS PRIOR, EXCLUDING WEEKENDS AND HOLIDAYS, TO STARTING EARLY WORK. IT'S THE CONTRACTORS RESPONSIBILITY TO PROTECT EXISTING UNDERGROUND UTILITIES DURING CONSTRUCTION. REPAIRS TO DAMAGED UTILITIES SHALL BE MADE AT NO EXPENSE TO THE OWNER.
- GROUND ELECTRIC SYSTEM IN ACCORDANCE WITH NEC SECTION 250.
- 3/4" CONDUIT SHALL BE THE MINIMUM SIZE CONDUIT INSTALLED. ALL CONDUIT SHALL BE RIGID STEEL CONDUIT, EXCEPT DUCT BANK WHICH IS PVC.
- ALL NEW MATERIAL REQUIRED SHALL CONFORM WITH THE STANDARDS OF UNDERWRITERS LABORATORIES (UL).
- CONTRACTOR SHALL PROVIDE TEMPORARY POWER TO SCADA SYSTEM FOR THE DURATION OF ALL PLANNED POWER OUTAGES.
- ALL PULL / JUNCTION BOXES AND CONDUITS SHOWN RUN BELOW THE CONCRETE CONTROL LEVEL DECK. CONTRACTOR SHALL SUPPORT CONDUITS IN ACCORDANCE WITH THE SPECIFICATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONDUIT ROUTING AND TERMINATIONS IN ACCORDANCE WITH ELECTRICAL AND INSTRUMENTATION SCHEDULES.

PLAN NOTES

- ROUTE CONDUIT ALONG OUTSIDE WALL FROM PULL BOX TO MTS. AVOID BLOCKING EXISTING LOUVER WITH CONDUITS.
- PROVIDE (2) JUNCTION BOXES (23" x 16" x 32" AND 23" x 22" x 32") BELOW MEZZANINE.
- PROVIDE 2.4KV-480V, 300KVA, 3 PHASE STEP DOWN TRANSFORMER. REPLACE EXISTING 65 AMP FEEDER FUSE WITH 100 AMP.
- EF-1, EF-2, EF-3 AND EF-4: REMOVE EXISTING OVERLOADS FROM EXISTING STARTERS AND REPLACE WITH NEW OVERLOADS. COORDINATE OVERLOAD SIZE WITH MECHANICAL CONTRACTOR. CONNECT NEW FANS TO EXISTING CONDUIT AND CONDUCTORS. COORDINATE ALL WORK WITH MECHANICAL CONTRACTOR.
- BUS TAP EXISTING MCC-CC2 AND CONNECT TO NEW DISCONNECT DS-1 AND DS-3. REFER TO ONE-LINE FOR ADDITIONAL INFORMATION. CONFORM TO NFPA 70 ARTICLE 240.
- PROVIDE NEW VFDs, HARMONIC FILTERS AND SSRV STARTERS FOR EXISTING PUMPS #1 AND #3. RETROFIT EXISTING CONDUIT WHERE FEASIBLE. PROVIDE ALL NEW FEEDERS. REFER TO INSTRUMENTATION DRAWINGS FOR ADDITIONAL SIGNAL CONDUIT INFORMATION AND TERMINATIONS.
- POWER CONDUCTORS FOR PUMPS #1 AND #3: PROVIDE CONDUCTORS BETWEEN RESPECTIVE ATS AND VFD, VFD AND RESPECTIVE PUMP(S). EACH PUMP'S CONDUCTORS SHALL BE KEPT SEPARATE FROM THE OTHER PUMP'S CONDUCTORS AT ALL TIMES INCLUDING JUNCTION BOXES.
- PROVIDE CONDUCTORS BETWEEN 2.4KV-480V STEP DOWN TRANSFORMERS AND NEW ATS(S). REUSE CONDUIT TO THE EXTENT POSSIBLE.
- PROVIDE SEPARATE JUNCTION BOXES FOR POWER AND COMMUNICATIONS.
- COORDINATE FAN CONTROL INTERFACE WITH THE MCC-CC2 IN ACCORDANCE WITH INSTRUMENTATION DRAWINGS.
- RELOCATE LIGHTING AT LOWER LEVEL AS REQUIRED TO ACCOMMODATE CONDUIT ROUTING.
- MODIFY MC9710 TO ACT AS A JUNCTION BOX WITH USE OF TERMINAL BOARDS FOR EXISTING COMMUNICATIONS. EXISTING TERMINAL NUMBERING SHALL BE REPLICATED ON NEW TERMINAL BOARDS. COMM. LINK LC2000 TO LC3000. SEE INSTRUMENTATION DRAWINGS FOR MORE INFORMATION.
- THE CONTRACTOR SHALL PROVIDE NEW CONDUIT AND SIGNAL WIRE, SIZED TO SUIT INSTALLATION, FROM EXISTING MC9710 JUNCTION BOX TO NEW LC3000.
- PROVIDE 2#12 AND 1#12 GROUND-3/4"C TO UPS RECEPTACLE, FIELD LOCATE TO SUIT EQUIPMENT LOCATION. CONNECT TO PANEL LB-1. CONTRACTOR SHALL COORDINATE LOCATION OF UPS.
- RECONNECT ELKRIDGE STATION CIRCULAR CHART RECORDER SIGNALS TO NEW STRIP CHART RECORDER EQUIPMENT AT NEW LOCATION IN LC3000 ENCLOSURE. SEE INSTRUMENTATION DRAWINGS FOR SIGNAL CONNECTIONS.
- ELECTRICAL WIRE TROUGH, DISCONNECTS 1, 2 AND 3 (DS-1, DS-2, DS-3) MOUNTED ABOVE TRANSFORMER 2 (T-2) VIA UNI-STRUTS.
- RELOCATE EX. G.B. FOOD-TANK CIRCULAR FLOW CHART RECORDER INTO NEW LC3000 CABINET, CONTRACTOR TO COORDINATE.
- PROVIDE 72" WIDE ENCLOSURE FOR LC3000 INSTALLATION. CONTRACTOR TO COORDINATE ALIGNMENT WITH EX. MCC-CC2 GEAR.
- PROVIDE NEW LEAD/LAG SELECTOR SWITCHES, FAILURE RESET ALARM, AND LEAD/LAG TROUBLE INDICATOR. REWIRE NEW EQUIPMENT TO EXISTING CONDITIONS.

MANUAL/AUTOMATIC TRANSFER SWITCH SCHEDULE

DESIGNATOR	VOLTAGE (VAC)	PHASE	QUANTITY PHASE POLES	TRANSITION TYPE	NEUTRAL	SWITCH RATING (AMPS)	TRANSFER TIME DELAY (SEC)	ENCLOSURE NEMA RATING	NUMBER SETS	NUMBER WIRES	WIRE SIZE (KCMIL)	GRD WIRE (AWG)	SHORT CIRCUIT RATING (INCHES)	BASIS OF DESIGN
ATS-1	480	3	4	OPEN	SWITCHED	400	0	12	1	4	500	3	22,000 ACIS	ASCO 4ATS B400N5L NEMA 12 FREESTANDING ENCLOSURE
ATS-2	480	3	3	OPEN	UNSWITCHED	800	0	12	2	3	500	2/0	22,000 ACIS	ASCO 4ATS 3800N5L NEMA 12 FREESTANDING ENCLOSURE
ATS-3	480	3	3	OPEN	UNSWITCHED	800	10	12	2	3	500	2/0	22,000 ACIS	ASCO 4ATSB 3800N5L NEMA 12 FREESTANDING ENCLOSURE
ATS-4	480	3	4	OPEN	SWITCHED	100	0	12	1	4	1	8	22,000 ACIS	GE ZENITH NEMA 12 ENCLOSURE
MTS-1	480	3	3	MANUAL	UNSWITCHED	800	-	4X	2	3	500	2/0	22,000 ACIS	EATON 800 AMP HNB
MTS-1	480	3	3	MANUAL	UNSWITCHED	800	-	4X	2	3	500	2/0	22,000 ACIS	EATON 800 AMP HNB

DISCONNECT SCHEDULE

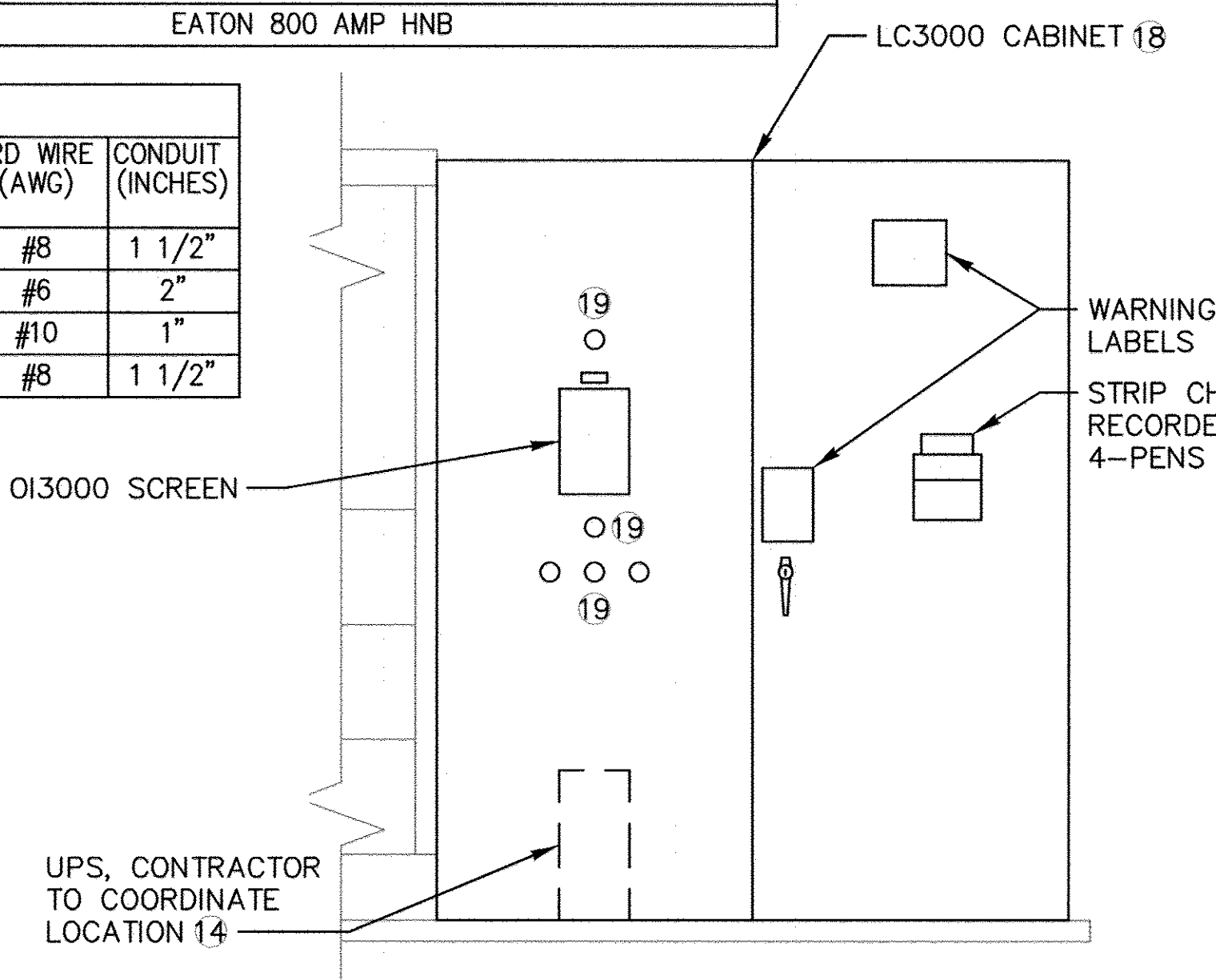
DESIGNATOR	VOLTAGE (VAC)	PHASE	QUANTITY BLADE(S)	QUANTITY FUSEHOLDERS	NEUTRAL BLADE	SWITCH RATING (AMPS)	FUSE RATING (AMPS)	NON FUSED DISCONNECT (AMPS)	NEMA RATING	HEAVY DUTY	NUMBER SETS	NUMBER WIRES	WIRE SIZE (KCMIL)	GRD WIRE (AWG)	CONDUIT (INCHES)
DS-1	600	3	4	3	1	100	100 (CLASS RK1)	-	NEMA 12	YES	1	3	#1	#8	1 1/2"
DS-2	600	3	4	3	1	200	200 (CLASS RK1)	-	NEMA 12	YES	1	3	#3/0	#6	2"
DS-3	600	3	3	1	-	100	50 (CLASS RK1)	-	NEMA 12	YES	1	3	#6	#10	1"
DS-4	600	3	3	0	-	100	-	-	NEMA 12	YES	1	3	#1	#8	1 1/2"

TRANSFORMER SCHEDULE

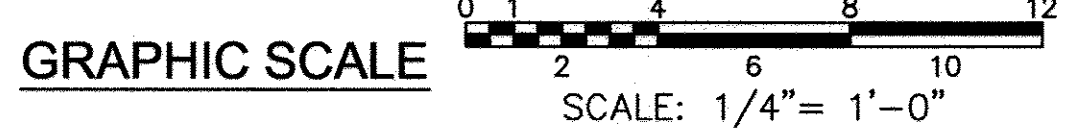
DESIGNATOR	PRIMARY VOLTAGE	PRIMARY CONFIGURATION	SECONDARY VOLTAGE	SECONDARY CONFIGURATION	RATING	MOUNTING STYLE	NEMA	BASIS OF DESIGN
T1	480V	DELTA	120/208	WYE	75KVA	FLOOR	NEMA 1	EATON-MV48M28F75CU
T2	2.4KV	DELTA	480/277	WYE	300KVA	FLOOR	NEMA 1	EATON-V42D47T33CUE3R
T3	480V	DELTA	120/208	WYE	30KVA	FLOOR	NEMA 2	EATON-V48M28T45EE
T4	2.4KV	DELTA	480/277	WYE	30KVA	FLOOR	NEMA 3R	-TEMGO-T38491-

LOAD BANK CONNECTION BOX

DESIGNATOR	VOLTAGE	CONNECTION TYPE	PHASE	NEUTRAL	RATING	MOUNTING STYLE	NEMA	BASIS OF DESIGN
LB-1	480V	MECHANICAL LUGS	3	N/A	800 AMP	FLOOR	4X	EATON-GTB08MAMA
LB-2	480V	MECHANICAL LUGS	3	N/A	800 AMP	FLOOR	4X	EATON-GTB08MAMA



A MCC-CC2 / LC3000 ENCLOSURE ELEVATION
E-1 SCALE: NONE



PROFESSIONAL CERTIFICATION
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33925, Expiration Date 1/15/19

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James P. Butler 1/31/18
CHIEF, UTILITY DESIGN DIVISION

James P. Butler 1/31/18
CHIEF, BUREAU OF ENGINEERING

James P. Butler 1/31/18
CHIEF, BUREAU OF UTILITIES

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STATE OF MARYLAND
PROFESSIONAL ENGINEER
NO. 33925
1/9/2018

DES: SEB	JFW	AS-BUILT	12/22/2017
DRN: JFW			
CHK: RDS			
DATE: 10/2014	BY: NO.	REVISION	DATE

1000 SCALE MAP NO. 32	BLOCK NO.20
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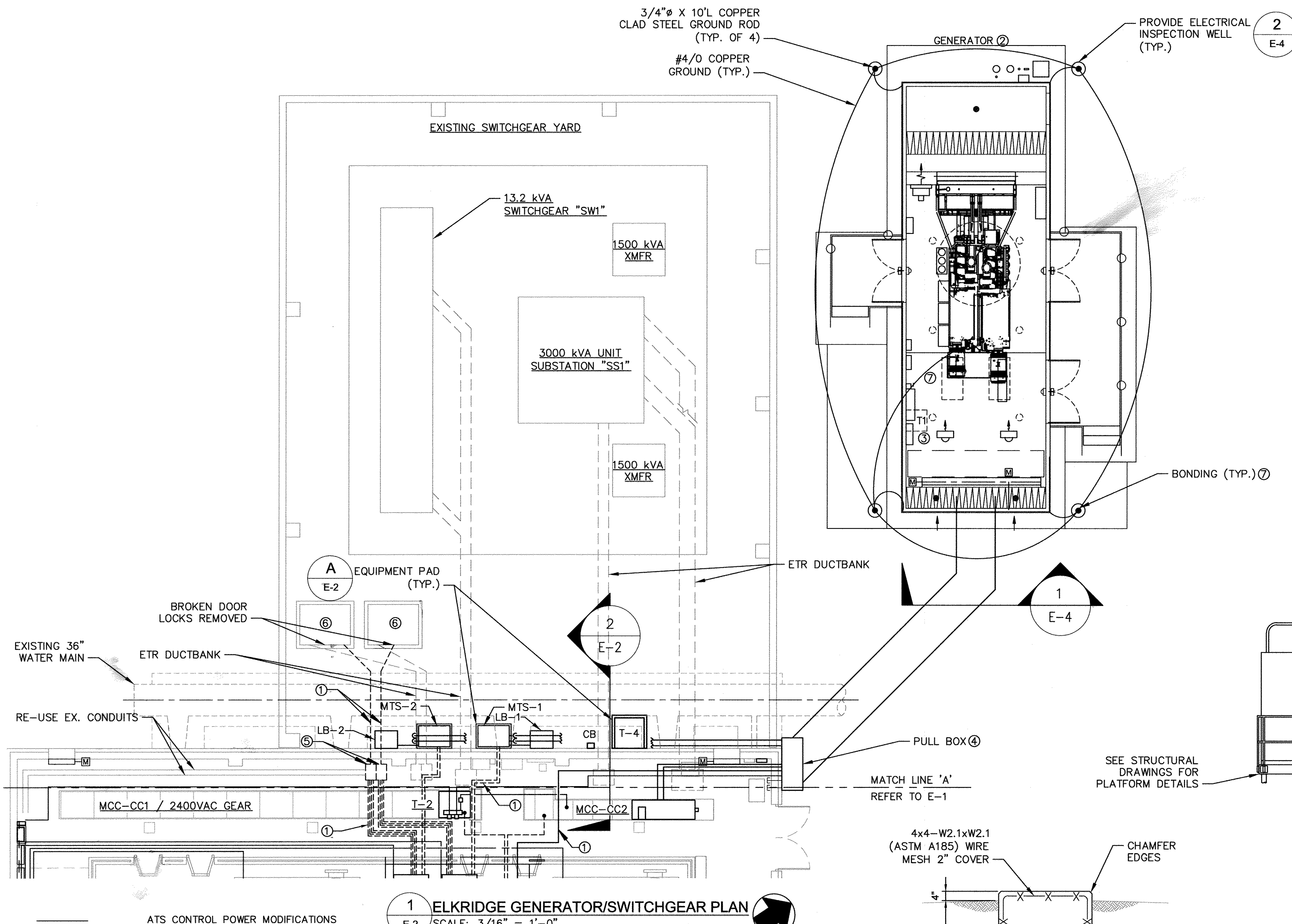
E-1

ELKRIDGE PUMP STATION IMPROVEMENTS

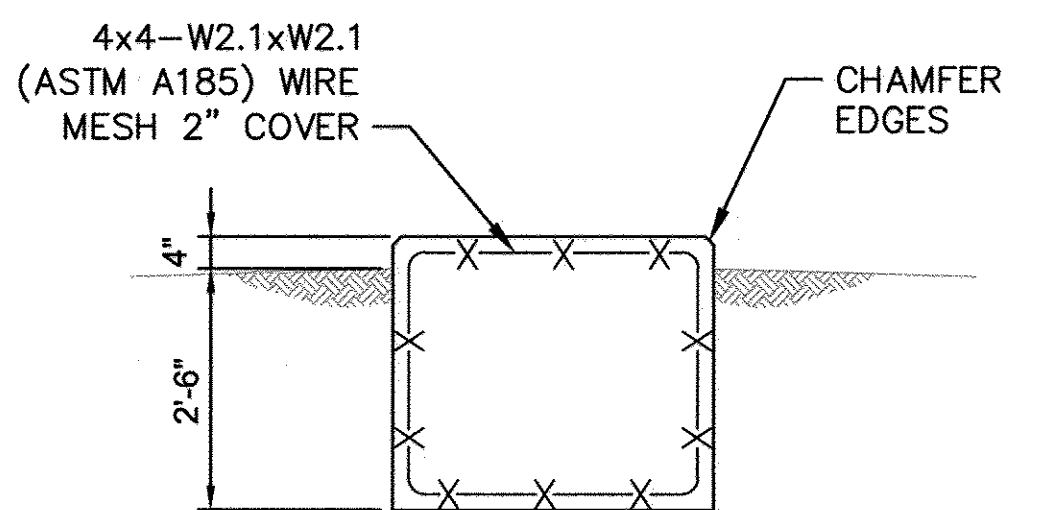
HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

SCALE AS SHOWN

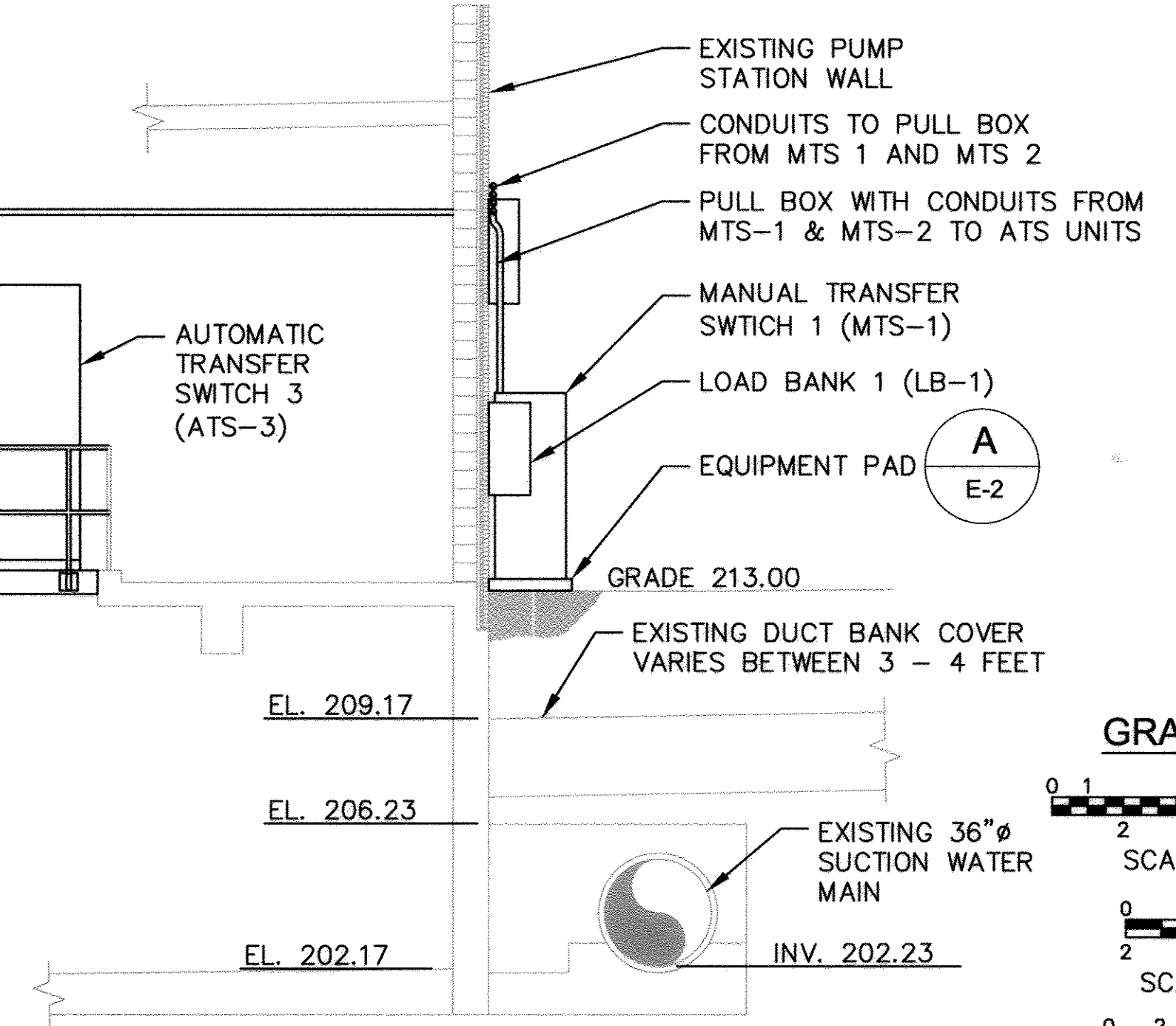
SHEET 10 OF 21



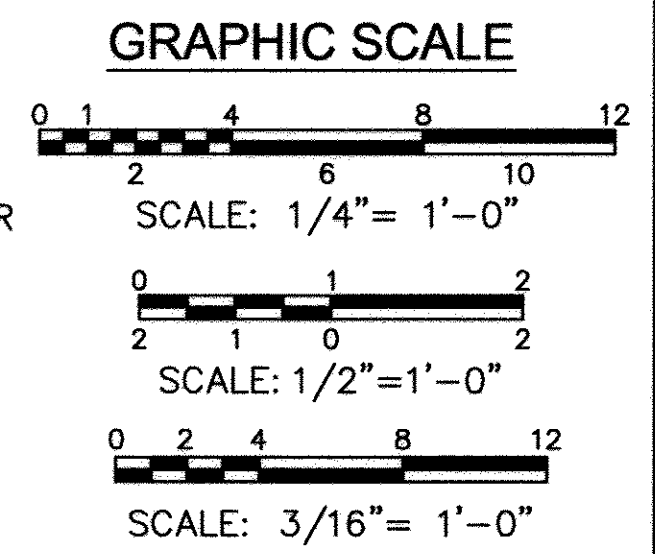
1 ELKRIDGE GENERATOR/SWITCHGEAR PLAN
E-2 SCALE: 3/16" = 1'-0"



A TYPICAL EQUIPMENT PAD DETAIL
E-2 SCALE: 1/2" = 1'-0"



2 ELKRIDGE SECTION
E-2 SCALE: 1/4" = 1'-0"

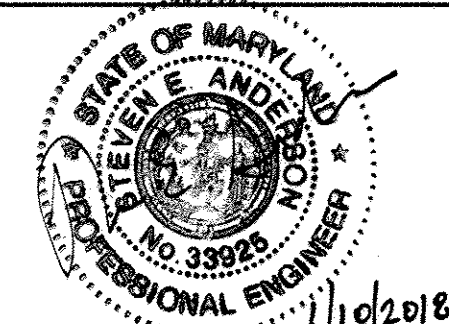


- NOTES:**
1. NOT ALL EXISTING AND NEW INTERIOR EQUIPMENT / SYSTEMS ARE SHOWN.
 2. ALL CONDUIT PENETRATIONS SHALL BE BOTTOM ENTRY.

- GENERAL NOTES**
1. ARRANGE CONDUIT, WIRING, EQUIPMENT AND OTHER WORK GENERALLY AS SHOWN, PROVIDING PROPER CLEARANCE AND ACCESS. CAREFULLY EXAMINE ALL CONTRACT DRAWINGS AND COORDINATE THE WORK WITH ALL TRADES. WHERE DEPARTURES ARE PROPOSED BECAUSE OF FIELD CONDITIONS OR OTHER CAUSES, PREPARE AND SUBMIT DETAILED DRAWING FOR ACCEPTANCE.
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 6. GROUND ELECTRIC SYSTEM IN ACCORDANCE WITH NEC ARTICLE 250.
 7. 3/4" CONDUIT SHALL BE THE MINIMUM SIZE CONDUIT INSTALLED. ALC CONDUIT SHALL BE RIGID ALUMINUM CONDUIT, EXCEPT DIRECT BURIAL WHICH IS PVC. WORK.
 8. ALL NEW MATERIAL REQUIRED SHALL CONFORM WITH THE STANDARDS OF UNDERWRITERS LABORATORIES (UL).
 9. FINAL CONNECTIONS TO GENERATOR SHALL BE MADE WITH FLEXIBLE METAL CONDUIT.

- PLAN NOTES**
- ① SEE FEEDER SCHEDULE ON E-3 FOR NEW CONDUCTORS (TYP.).
 - ② REFER TO M-03 FOR GENERATOR LAYOUT. COORDINATE CONDUIT STUB-UP LOCATIONS WITH GENERATOR MANUFACTURER'S RECOMMENDATIONS.
 - ③ COORDINATE TRANSFORMER LOCATION WITH GENERATOR MANUFACTURER.
 - ④ PROVIDE SEPARATE JUNCTION BOXES FOR COMMUNICATIONS AND POWER. COORDINATE WITH INSTRUMENTATION DRAWINGS.
 - ⑤ EXISTING JUNCTION BOXES (TO BE REPLACED, REFER TO SHEET E-1).
 - ⑥ EXISTING 2.4KV-480VOLT, 750KVA TRANSFORMER. EXISTING 2.4KV CONDUIT AND CONDUCTORS TO REMAIN.
 - ⑦ BOND GENERATOR HOUSING AND GENERATOR'S ALTERNATOR PER MANUFACTURER'S AND NFPA RECOMMENDATIONS.

PROFESSIONAL CERTIFICATION.
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DES: SEB	JFW	AS-BUILT	12/22/2017
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DATE: 10/2014	BY: NO.	REVISION	DATE

ELECTRICAL - PLAN GENERATOR

1000 SCALE MAP NO. 32 BLOCK NO.20

ELKRIDGE PUMP STATION IMPROVEMENTS
HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

E-2
SCALE AS SHOWN
SHEET
11 OF 21

KCI TECHNOLOGIES PROJECT No.: 13-12267718

UNDERGROUND SERVICE FDR1
BY POWER CO.

TRANSFORMER #1,
1500/1725KVA, OA/FA 65°C
13.2KV-2400V/1385V, 3φ,
60HZ, 5.39% IMPEDANCE

UNDERGROUND SERVICE FDR2
BY POWER CO.

TRANSFORMER #2,
1500/1725KVA, OA/FA 65°C
13.2KV-2400V/1385V, 3φ,
60HZ, 5.39% IMPEDANCE

13.2KV SWITCHGEAR AND KEY INTERLOCKS, SYSTEM NORMALLY OPERATES IN TWO INDEPENDENT HALVES.

2.4KV SWITCHGEAR AND KEY INTERLOCKS, SYSTEM NORMALLY OPERATES IN TWO INDEPENDENT HALVES.

GENERAL NOTES

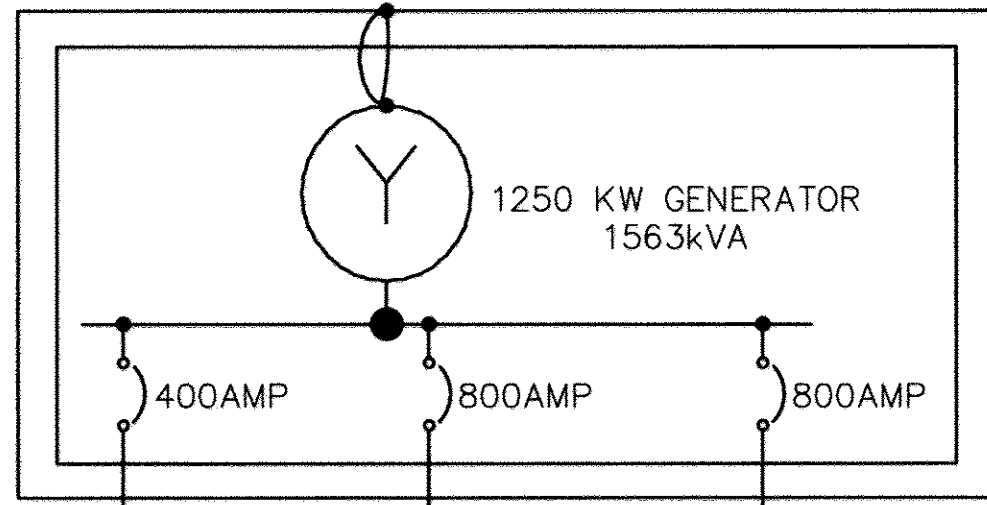
- SEE PLAN SHEET E1 FOR DISCONNECT SWITCH (DS) SCHEDULE.
- SEE PLAN SHEET E1 FOR AUTOMATIC TRANSFER SWITCH (ATS) SCHEDULE.
- CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING CONDUCTORS BETWEEN THE 750 KVA, 2400V-480V TRANSFORMERS (TYP. OF 2) AND THE VFD'S.
- CONTRACTOR SHALL DISCONNECT AND REMOVE CONDUIT AND CONDUCTORS BETWEEN THE 150 KVA, 3-POLE, 2400-480/277V TRANSFORMER AND MOTOR CONTROL CENTER 'CC2'.
- SEE PLAN SHEET E-1 FOR TRANSFORMER (T) SCHEDULE.

PLAN NOTES

- BUS TAP THE EXISTING MCC AND FEED DISCONNECT SWITCHES. CONFORM TO NFPA 70 ARTICLE 240.
- ALL CONDUITS SHALL BE 4" FOR POWER AND 3" FOR CONTROL IN DUCT BANK AND TO 12" AFG. TRANSITION TO RGS PRIOR TO EXITING DUCT BANK CONCRETE ENVELOPE.
- REMOVE AND REPLACE EXISTING FUSE WITH GE100E FUSE, OR EQUIVALENT.
- REMOVE AND REPLACE EXISTING 150KVA TRANSFORMER WITH 300KVA, 3 PHASE, 2.4KV-480/277V TRANSFORMER.
- REMOVE AND REPLACE EXISTING 2.4KV CONDUCTOR WITH: (3) #2, 2.4KV, #6GND, 4"C.
- PROVIDE #500KCMIL TWO BOLT MECHANICAL LUG(S) FOR CONNECTION TO LOAD BANK(S).

SYMBOLS

- (49) / OL THERMAL OVERLOAD RELAY
- (50G) INSTANTANEOUS GND. OVERCURRENT RELAY
- (51) TIME DELAY OVERCURRENT RELAY
- (86) / LOR LOCKOUT TRIPPING RELAY, HAND RESET
- (A) AMMETER
- (AS) AMMETER SWITCH
- (V) VOLTMETER
- (VS) VOLTMETER SWITCH
- (OC) TIME INVERSE, INSTANTANEOUS OVERCURRENT AND GROUND FAULT RELAY GE MULTILIN 735
- (Circuit Breaker Symbol) CIRCUIT BREAKER
- (Current Transformer Symbol) CURRENT TRANSFORMER
- (Power Transformer Symbol) POWER TRANSFORMER
- (Ground/Ground Rod Symbol) GROUND/GROUND ROD
- (Fuse Symbol) FUSE
- (Normally Open Contact Symbol) NORMALLY OPEN CONTACT
- (Drawout Device Contact Symbol) DRAWOUT DEVICE CONTACT
- (Switch Symbol) SWITCH
- (Connect to Existing Symbol) CONNECT TO EXISTING
- (Generator Symbol) GENERATOR
- (ATS Symbol) AUTOMATIC TRANSFER SWITCH (ATS)



LOAD INTERRUPTER SWITCH (CC1-7) 2.4KV, 600A, 3P, 60KV BIL

LOAD INTERRUPTER SW. 2.4KV, 600A, 3P, 60KV BIL

LOAD INTERRUPTER SWITCH (CC1-13) 2.4KV, 600A, 3P, 60KV BIL

FEEDER DESIGNATION	CONDUCTOR SETS	PHASE CONDUCTORS SIZE	NEUTRAL CONDUCTOR SIZE	GROUND CONDUCTOR SIZE	CONDUIT SETS	CONDUIT SIZE
15NG,20NG	1	#12	#12	#12	1	3/4"
40G	1	#8	-	#8	1	3/4"
100NG	1	#1	#1	#8	1	2 1/2"
125G	1	#1	-	#6	1	2"
200NG	1	3/0	3/0	#6	1	2"
225NG	1	4/0	4/0	#2	1	2 1/2"
400NG	1	500	500	#3	1	4"
800G	2	500	-	2/0	2	4"
100G	1	#2-2.4KV	-	#6	1	4"

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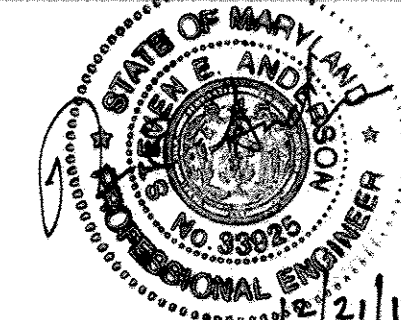
1 SINGLE LINE POWER DIAGRAM
SCALE: NOT TO SCALE

Dec 21, 2017 - 12:41pm User: jpkd, vtdc M:\2013\122677_18\Drawings\AS-Built Diagrams\AS-Built Diagram.dwg

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Director of Public Works: *[Signature]* DATE: 1-30-18
Chief, Bureau of Utilities: *[Signature]* DATE: 1/31/18
Chief, Utility Design Division: *[Signature]* DATE: 1/31/18

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DES: SEB	JFW	AS-BUILT	12/22/2017
DRN: JFW			
CHK: RDS			
DATE: 10/2014	BY: NO.	REVISION	DATE

ELECTRICAL - SINGLE LINE DIAGRAM

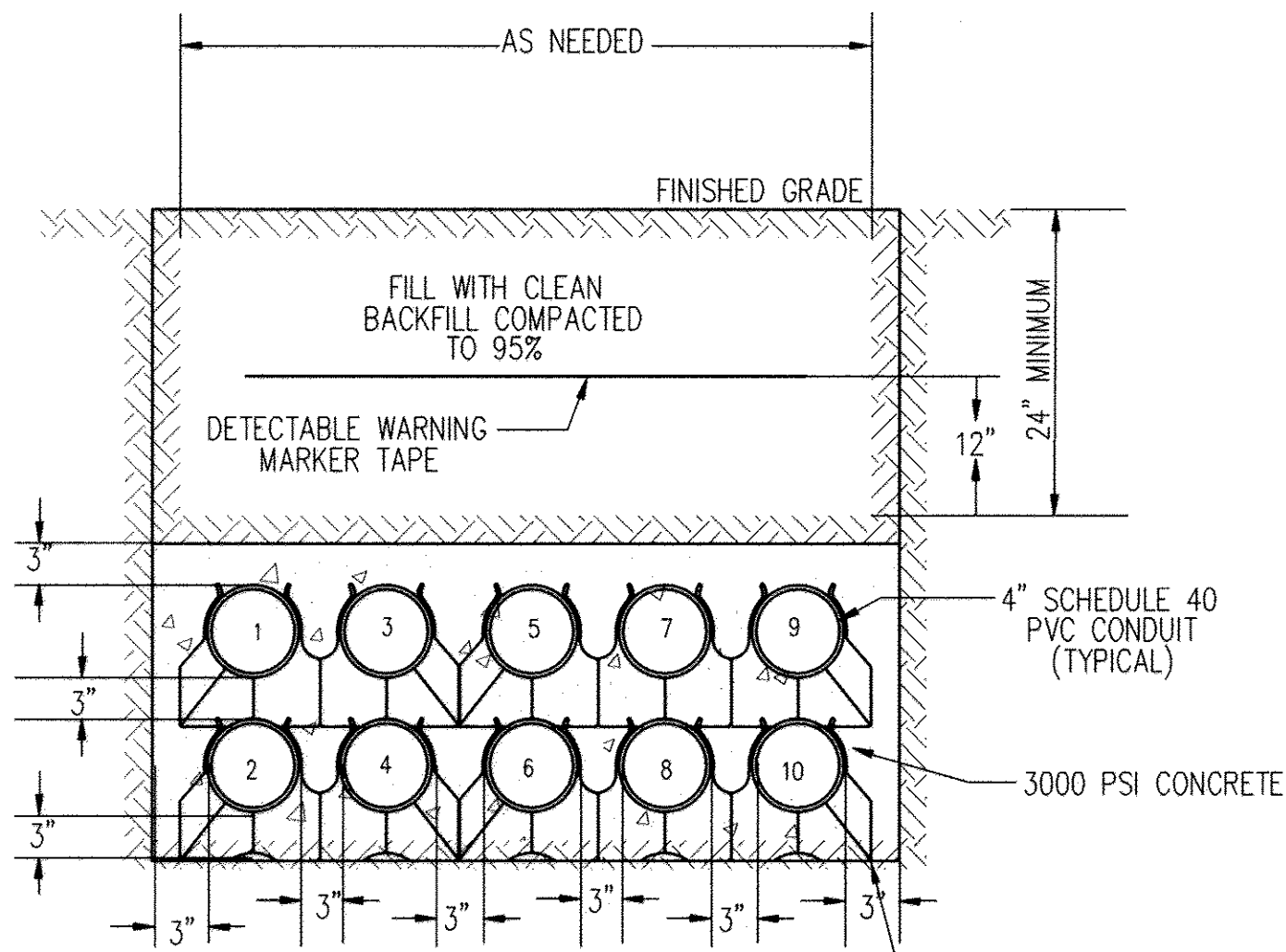
1000 SCALE MAP NO. 32 BLOCK NO.20

ELKRIDGE PUMP STATION IMPROVEMENTS

HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

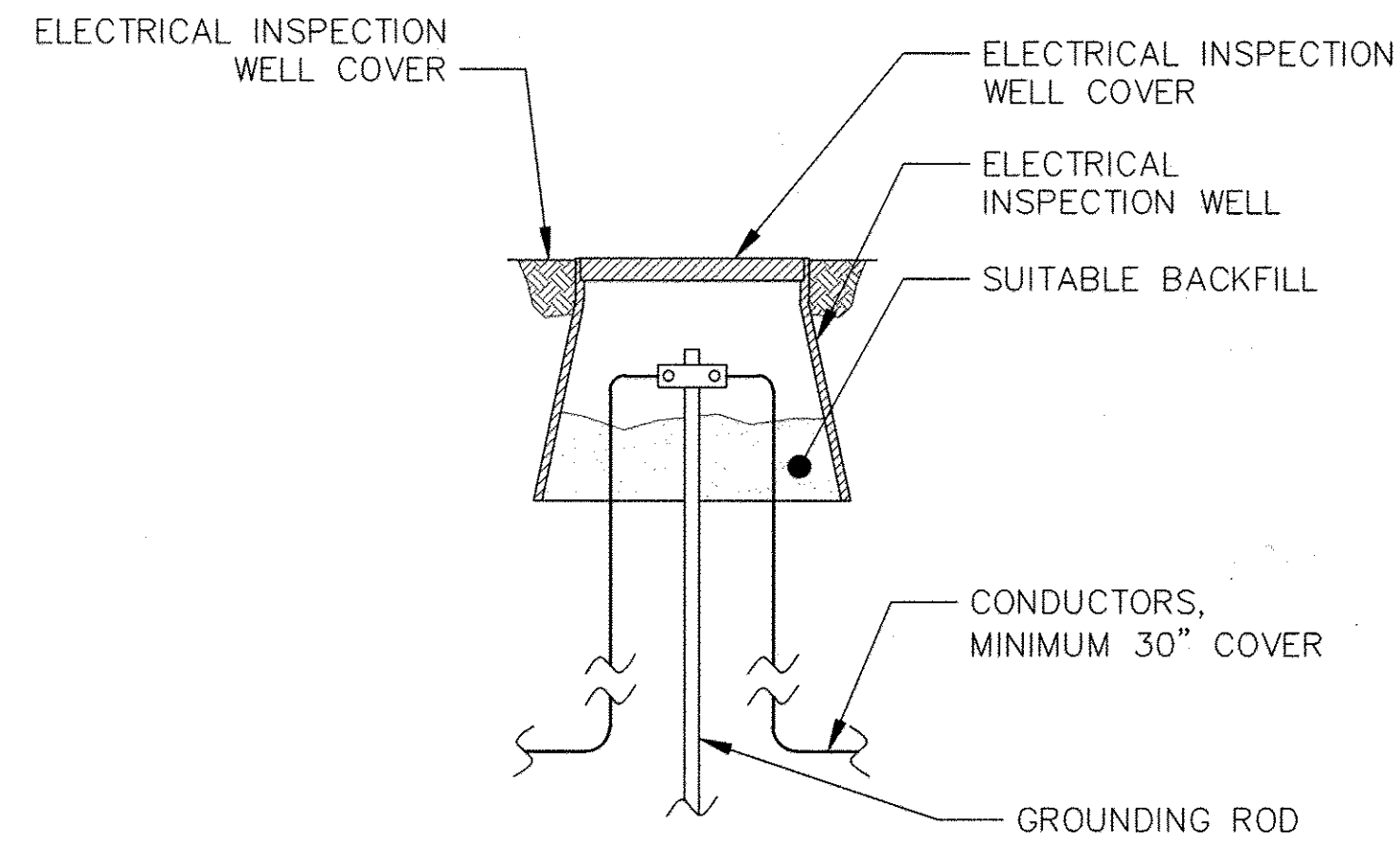
E-3
SCALE AS SHOWN
SHEET
12 OF 21

AS BUILT REPLACEMENT SHEET



- CONDUIT DESIGNATIONS:**
1. GENERATOR TO ATS-1: 4°C
 2. GENERATOR TO ATS-2: 4°C
 3. GENERATOR TO ATS-2: 4°C
 4. GENERATOR TO ATS-3: 4°C
 5. GENERATOR TO ATS-3: 4°C
 6. GENERATOR TRANSFORMER TO MCC, 4°C
 7. SPARE: COMMUNICATIONS
 8. SPARE: POWER
 9. CONTROL: SIGNAL, 3°C
 10. CONTROL: DISCRETE, 3°C
- DUCT SPACER LOCATED EVERY 5' ALONG DUCT BANK - UNDERGROUND DEVICES INC., WUNREECE DUCT SPACER OR EQUAL.

1 10-WAY DUCTBANK DETAIL
E-4 SCALE: NOT TO SCALE



NOTE: SEE THE NFPA 70 FOR ELECTRICAL INSPECTION WELL AND GROUNDING GRID INSTALLATION REQUIREMENTS.

2 GROUNDING AND BONDING DETAIL
E-4 SCALE: NOT TO SCALE

PANELBOARD NAME: LB																			
VOLTAGE:		120/208V		BUS RATING:		100A		POLES:		30		MINIMUM A.I.C. RATING(A):		10K					
PHASE/WIRE:				3 PHASE, 4 WIRE +GROUND				MAIN:		100A MCB		MOUNTING:		SURFACE, NEMA 12		SERVICE:		DISTRIBUTION	
CKT NO.	LOAD TYPE	LOAD DESCRIPTION		BKR P	LOAD TRIP	PHASE LOAD (VA)			LOAD (VA)	BKR P	LOAD DESCRIPTION		LOAD TYPE	CKT NO.					
1	S	WATER MON. UPS		1	20	1000	1000				1	20	SPARE		2				
3	N	MC9710 - CP		1	20	240		240			1	20	SPARE		4				
5		SPACE						240		240	1	15	LC2000 - CP	N	6				
7		SPACE						960		960	3	15	VENTILATION PANEL	N	8				
9		SPACE						960		960			-	N	10				
11		SPACE								960			-	N	12				
13		SPACE		1	20	0					1	20	SPARE		14				
15		SPACE		1	20	0		0			1	20	SPARE		16				
17		SPACE		1	20	0		0			1	20	SPARE		18				
19		SPACE				0							SPACE		20				
21		SPACE						0					SPACE		22				
23		SPACE						0					SPACE		24				
25		SPACE				0							SPACE		26				
27		SPACE						0					SPACE		28				
29		SPACE								0			SPACE		30				
TOTAL CONNECTED LOAD (VA)						4360	1960	1200	1200				(VA/PHASE)						
TOTAL CONNECTED LOAD (A)						12.10	16.33	10.00	10.00				(AMPS/PHASE)						

PROFESSIONAL CERTIFICATION.
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DRN: JFW			
CHK: RDS			
DATE: 10/2014	BY NO.	REVISION	DATE

ELECTRICAL - PANELBOARD SCHEDULE AND DETAILS

1000 SCALE MAP NO. 32 BLOCK NO.20

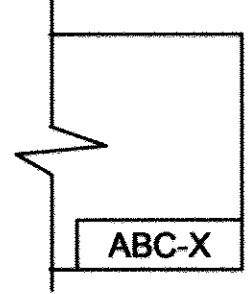
ELKRIDGE PUMP STATION IMPROVEMENTS
HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

KCI TECHNOLOGIES PROJECT No.: 13-12267718

Dec 21, 2017, 12:30pm User: jfwd\jw User: jfwd\jw
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P & I LEGEND

ABC-X
↑
SEQUENTIAL NUMBER
IDENTIFICATION



PANEL LEGEND

- AF = ACTIVE FILTER
- J = JUNCTION BOX
- L = LOCAL CONTROL PANEL
- LC3000 = COMMUNICATIONS HUB
- MCC-X = MOTOR CONTROL CENTER
- MICROCAT = MAIN CONTROLLER
- TB = TERMINAL BOARD
- TEL-X = TELEPHONE
- VCP-X = VENTILATION CONTROL PANEL
- VFD-X = VARIABLE FREQUENCY DRIVE

LEGEND

- EX. SYSTEM
- NEW SYSTEM
- - - POWER
- · - · - SIGNAL
- TEL PHONE LINE / COMMUNICATIONS
- ATS CONTROL POWER MODIFICATIONS

EQUIPMENT LEGEND

ABC-X
↑
SEQUENTIAL NUMBER
IDENTIFICATION

- ATS = AUTOMATIC TRANSFER SWITCH
- DP-X = DRAIN PUMP
- EF-X = EXHAUST FAN
- FM-X = FLOW METER
- FOM = FUEL OIL MONITOR
- FPS = FUEL POLISHING SYSTEM
- HT-X = HEAT TRACE
- LB-X = LOAD BANK
- MTS = MANUAL TRANSFER SWITCH
- MOV-X = MOTOR OPERATED VALVE
- PM = POWER MONITOR
- RASP-X = RETURN ACTIVATED SLUDGE PUMP
- SOL-X = SOLENOID VALVE
- SSRVS = SOLID STATE REDUCED VOLTAGE STARTER
- T_H = THERMOSTAT HEAT
- T_V = THERMOSTAT VENTILATION

GENERAL ABBREVIATIONS

- AUTO = AUTOMATIC
- ARV = AIR RELEASE VALVE
- ATS = AUTOMATIC TRANSFER SWITCH
- CB = CIRCUIT BREAKER
- CP = CONTROL POWER
- DPDT = DOUBLE POLE-DOUBLE THROW
- ECD = ELECTRICAL CONTROL DIAGRAM
- ETM = ELAPSED TIME METER
- GND = GROUND
- HMI = HUMAN MACHINE INTERFACE
- I/O = INPUT/OUTPUT
- JB = JUNCTION BOX
- MB = MAIN BREAKER
- OIT = OPERATOR INTERFACE TERMINAL
- P&ID = PROCESS AND INSTRUMENTATION DIAGRAM
- PM = PHASE MONITOR
- TB = TERMINAL BOARD
- TVSS = TRANSIENT VOLTAGE SURGE SUPPRESSION
- VAC = VOLTS/ALTERNATING CURRENT
- VFD = VARIABLE FREQUENCY DRIVE
- XFMR = TRANSFORMER

INSTRUMENT, EXAMPLES

- FIT = FLOW INDICATING TRANSMITTER
- PIT = PRESSURE INDICATING TRANSMITTER
- ZS = POSITION SWITCH

P & I D NUMBERING SEQUENCE

- 200 SERIES = EX. LC2000
- 300 SERIES = BOOSTER PUMP SYSTEMS, EX. MC9710
- 400 SERIES = GENERATOR SYSTEMS
- 500 SERIES = AUXILIARY SYSTEMS

PROCESS LEGEND

- D = DRAIN
- NPW = NON-POTABLE WATER
- PW = POTABLE WATER
- S = SANITARY
- W = WATER

GENERAL NOTES

- SEE MECHANICAL DRAWINGS FOR FIELD INSTRUMENT LOCATIONS.
- FOR ECD SYMBOLS, SEE SHEET 1-2.
- FOR POWER DISTRIBUTION AND DISCONNECT REQUIREMENTS, SEE ELECTRICAL DRAWINGS.

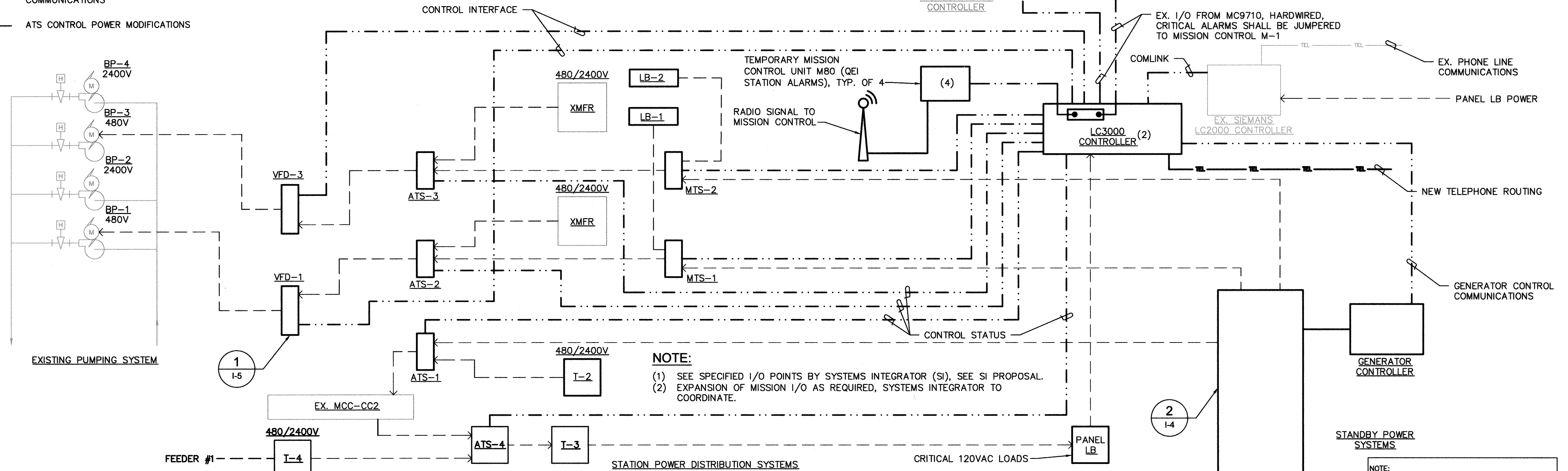
- (X) CODED NOTES
- (X) CONSTRUCTION NOTES
- (X) REMOVAL NOTES

(ISA) INSTRUMENT IDENTIFICATION SCHEDULE

FIRST LETTER	SUCCEEDING LETTER				
	VARIABLE	MODIFIER	PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		AUTOMATIC
B	BREAKER		USER'S CHOICE	CLOSE OR STOP	BYPASS/REVERSE
C	COMMUNICATIONS			CONTROL	
D	DENSITY	DIFFERENTIAL		OPEN OR START	
E	VOLTAGE (EMF)		PRIMARY ELEMENT	SENSOR	
F	FLOW RATE	RATIO	FAIL	FAIL	FAIL/INCOMPLETE
G	GAUGING		GLASS		LOCAL/MANUAL/HAND
H	HAND				HIGH OR OPEN
I	CURRENT		INDICATE		INTERMEDIATE
J	POWER	SCAN			
K	TIME	TIME RATE		CONTROL STATION	
L	LEVEL		LIGHT		LOW OR CLOSE
M	MOTOR	MOMENTARY		MOTOR	MIDDLE
N	STATUS		INPUT	FORWARD	ON OR OPERATE
O				OFF	OVERLOAD
P	PRESSURE	PNEUMATIC	POINT (TEST)	POSITION	
Q	QUALITY OR EVENT	TOTALIZE		EMERGENCY/ABNORMAL	
R	RADIOACTIVITY		RECORD OR PRINT	REMOTE	RUN/FORWARD
S	SPEED OR FREQUENCY	SUM	SWITCH	SWITCH	STOP
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VARIABLE OR VISCOSITY			VALVE OR DAMPER	VFD/VALVE
W	WEIGHT OR FORCE	TORQUE	WELL		UNCLASSIFIED
X	MOD. LIGHT OR VALVE		UNCLASSIFIED	UNCLASSIFIED	RESET
Y	INTERLOCK			RELAY OR COMPUTE	
Z	POSITION			DRIVE OR ACTUATOR	

PROGRAMMING NOTES

- THE EXISTING MICROCAT CONTROLLER SHALL BE REUSED AS A JUNCTION BOX WITH NEW TERMINAL BOARDS. NEW TERMINAL BOARD NUMBERS SHALL BE REPLICATED FROM EXISTING TERMINAL BOARD.
- ALL NEW I/O AND CONTROL FEATURES SHALL BE INCORPORATED INTO THE LC3000 COMMUNICATIONS HUB. SEE PUMP CONTROL AND GENERATOR I/O SPECIFIED IN CONTRACT DOCUMENTS FOR COMPLETE I/O LIST.
- CONNECT ALL EX. I/O TO RETROFITTED TERMINAL BOARDS IN MC9710, HARDWIRE BACK TO LC3000.
- PROVIDE ONE (1) TEMPORARY MISSION CONTROL M80 FOR EACH SPS NETWORKED THROUGH ELKRIDGE BPS.



NOTE:

- SEE SPECIFIED I/O POINTS BY SYSTEMS INTEGRATOR (SI), SEE SI PROPOSAL.
- EXPANSION OF MISSION I/O AS REQUIRED, SYSTEMS INTEGRATOR TO COORDINATE.

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1 STATION IMPROVEMENTS KEY PLAN
SCALE: NONE

DES: SEA	JFW	AS-BUILT	12/22/2017
DRN: JFW			
CHK: SEA			
DATE: 10/2014	BY: NO.	REVISION	DATE

PROCESS LEGEND NOTES AND KEY PLAN

1000 SCALE MAP NO. 32 BLOCK NO.20

ELKRIDGE PUMP STATION IMPROVEMENTS
HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

SCALE AS SHOWN
SHEET 14 OF 21

AS BUILT REPLACEMENT SHEET

PROCESS AND INSTRUMENTATION SYMBOLS

- EXISTING PROCESS FEATURES
- DIGITAL SIGNALS
- EQUIPMENT GROUPED AS A TYPICAL ARRANGEMENT OF MULTIPLES OF THE SAME PROCESS.
- ELECTRICAL SIGNAL
- REMOTE I/O
- SOFTWARE OR COMMUNICATIONS DATA SIGNAL
- ANALOG SIGNALS
- VENT
- PNEUMATIC SIGNAL (COMPRESSED AIR)
- ELECTRICAL SERVICE
- PROCESS FLOW
- ANALOG INPUT
- ANALOG OUTPUT
- DIGITAL INPUT
- DIGITAL OUTPUT
- X = A DESIGNATED CONTINUATION NUMBER WITH RESPECT TO A SPECIFIC SIGNAL. E.G.
 - ① - - - - ->
 - ② - - - - ->
- FIELD-MOUNTED DEVICE
- PANEL-MOUNTED DEVICE
- INDICATING LAMP - X INDICATES LENS COLOR:
 R = RED G = GREEN
 W = WHITE A = AMBER
- PLC OR REMOTE INPUT/OUTPUT
- PCS PLC INPUT/OUTPUT
- SIGNAL BOOSTER/ISOLATOR (X) PANEL LOCATION
- SUBMERSIBLE TRANSDUCER
- ULTRASONIC LEVEL INDICATOR
- INTERPOSING RELAY (X) PANEL LOCATION
- PROCESS CONTINUATION

PROCESS AND INSTRUMENTATION SYMBOLS

- PRESSURE SWITCH
- LIMIT SWITCH
- FLOW SWITCH
- FLOAT SWITCH
- RECEPTACLE
- EXTERIOR PLUG CONNECTION
- TERMINAL BOARD
- TERMINAL ENCLOSURE OR J - JUNCTION
- ELECTRICAL DISCONNECT
- JUNCTION BOX, HAZARDOUS LOCATION
- JUNCTION BOX, NON-HAZARDOUS LOCATION
- EXPLOSION PROOF SEAL-OFF

HAND SWITCHES

- (XXX) SELECTOR SWITCH OR PUSH BUTTON (MAINTAINED CONTACTS)
- (XXX) HAND CONTROL STATION
- (XXX) MOMENTARY SELECTOR SWITCH

HAND SWITCH-NOTES (XXX)

- ACK = ACKNOWLEDGE PUSHBUTTON
- CL = CLOSE (PUSHBUTTON)
- ES = EMERGENCY STOP (PUSHBUTTON)
- HOA = HAND OFF AUTOMATIC (SELECTOR SWITCH)
- LO = LOCKOUT STOP (PUSHBUTTON)
- LR = LOCAL/REMOTE (SELECTOR SWITCH)
- MA = MANUAL/AUTOMATIC (SELECTOR SWITCH)
- OP = OPEN (PUSHBUTTON)
- POT = POTENTIOMETER (HAND CONTROL)
- RES = RESET (PUSHBUTTON)
- SEL = SELECTOR
- SP = STOP (PUSHBUTTON)
- ST = START (PUSHBUTTON)
- V-O-SSRV = VFD - OFF - SOLID STATE REDUCED VOLTAGE STARTER

ANALYZERS

- XXX-INDICATES:
 pH
 ORP OXYGEN REDUCTION POTENTIAL
 DO DISSOLVED OXYGEN
 NH₃ AMONIA

EQUIPMENT SYMBOLS

- AIR RELEASE VALVE
- BALL CHECK VALVE
- BALL VALVE
- BASKET STRAINER (HIGH FLOW)
- WYE STRAINER (LOW FLOW)
- BUTTERFLY VALVE
- CALIBRATION CYLINDER
- CENTRIFUGAL PUMP
- CHECK VALVE
- DOUBLE DOOR CHECK VALVE
- EXPANSION JOINT
- FLEXIBLE HOSE
- FLOAT
- FLOW METER (MAGNETIC)
- GATE VALVE
- GLOBE VALVE
- HOSE BIBB
- ISOLATION VALVE
- METERING PUMP
- MOTOR
- MOTOR ACTUATOR
- MOTORIZED BALL VALVE
- NEEDLE VALVE
- PANEL JUNCTION BOX
- PRESSURE REGULATING VALVE
- PRESSURE RELIEF VALVE
- SUBMERSIBLE MIXER
- PUMP (AUXILIARY)
- REDUCER OR INCREASER
- ROTA-METER

EQUIPMENT SYMBOLS

- MOTORIZED BUTTERFLY VALVE
- CAPPED FLUSHING CONNECTION (F.C.)
- FLOW METER (THERMAL DISPERSION)
- MOTORIZED GATE VALVE
- MOTORIZED PINCH VALVE
- SLUICE GATE
- SOLENOID VALVE
- SOLENOID VALVE (3-WAY)
- STATIC MIXER
- TWO-WAY-THREE PORT VALVE, OR THREE WAY VALVE
- TRUCK QUICK CONNECTION
- UNION

ELECTRICAL CONTROL DIAGRAM SYMBOLS (ECD)

- INCOMING LINE
- OUTGOING LINE
- CIRCUIT BREAKER
- CONTACTS - NORMALLY CLOSED
- CONTACTS - NORMALLY OPEN
- CONTROL POWER TRANSFORMER
- CONTROL RELAY (SEQUENTIAL)
- DISCONNECT SWITCH
- ELAPSED TIME METER
- FLOAT SWITCH - NORMALLY OPEN, CLOSE ON LEVEL DROP
- FLOAT SWITCH - NORMALLY OPEN, CLOSE ON LEVEL RISE
- FUSE
- GROUND (GND)
- HEAT TRACE
- HAND-OFF AUTOMATIC SWITCH
- INDICATING LAMP INTEGRAL WITH HOA SELECTOR
- LIMIT SWITCH - NORMALLY OPEN
- MANUAL MOTOR STARTER, SINGLE-POLE
- OVERCURRENT ELEMENT THERMOSTAT
- PHASE MONITOR
- PLC OUTPUT (RTU OUTPUT)
- PRESSURE SWITCH - NORMALLY OPEN - CLOSURES ON PRESSURE DROP
- PRESSURE SWITCH - NORMALLY OPEN - CLOSURES ON PRESSURE RISE
- PUSH-BUTTON - MOMENTARY CONTACT
- PUSH-BUTTON - MOMENTARY CONTACT START/STOP
- PUSH-PULL BUTTON - MAINTAINED CONTACT
- PUSH TO TEST (TRANSFORMER TYPE) INDICATING LAMP - X INDICATES LENS COLOR:
 R = RED (RUN) B = BLUE (POSITION)
 G = GREEN (STOP) Y = YELLOW (POSITION)
 W = WHITE (POWER) A = AMBER (ALARM)
- REPEAT CYCLE TIMER
- SOLENOID

ELECTRICAL CONTROL DIAGRAM SYMBOLS (ECD)

- STARTER OR CONTACT COIL - DESIGNATION AS INDICATED
- START-STOP PUSHBUTTON - MAINTAINED CONTACT
- THERMOSTAT, NORMALLY CLOSED
- TIMER
 NOTC NCTO
- TORQUE SWITCH - N.O. - CLOSURES ON HIGH TORQUE

RISER DIAGRAM SYMBOLS

- ISA - P&ID NUMBERS
- DISCRETE SIGNAL/CONDUIT
- ANALOG SIGNAL/CONDUIT
- EXISTING WORK
- NEMA BOUNDARY

ABC - LETTERS INDICATE FUNCTION ACCORDING TO IDENTIFICATION ASSOCIATED WITH ISA SCHEDULE.
 123 - DIGITS INDICATE SEQUENTIAL EQUIPMENT

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DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND

[Signature] 10/24/14
 DIRECTOR OF PUBLIC WORKS DATE

[Signature] 10/22/14
 CHIEF, BUREAU OF ENGINEERING DATE

[Signature] 10/22/14
 CHIEF, BUREAU OF UTILITIES DATE

[Signature] 10/22/14
 CHIEF, UTILITY DESIGN DIVISION DATE

KCI TECHNOLOGIES

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STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 License No. 33925
 10/15/14

DES: SEA	JFW	AS-BUILTS	12/22/14
DRN: JFW			
CHK: SEA			
DATE: 10/20/14	BY NO.	REVISION	DATE

INSTRUMENTATION AND CONTROL DIAGRAM SYMBOLS

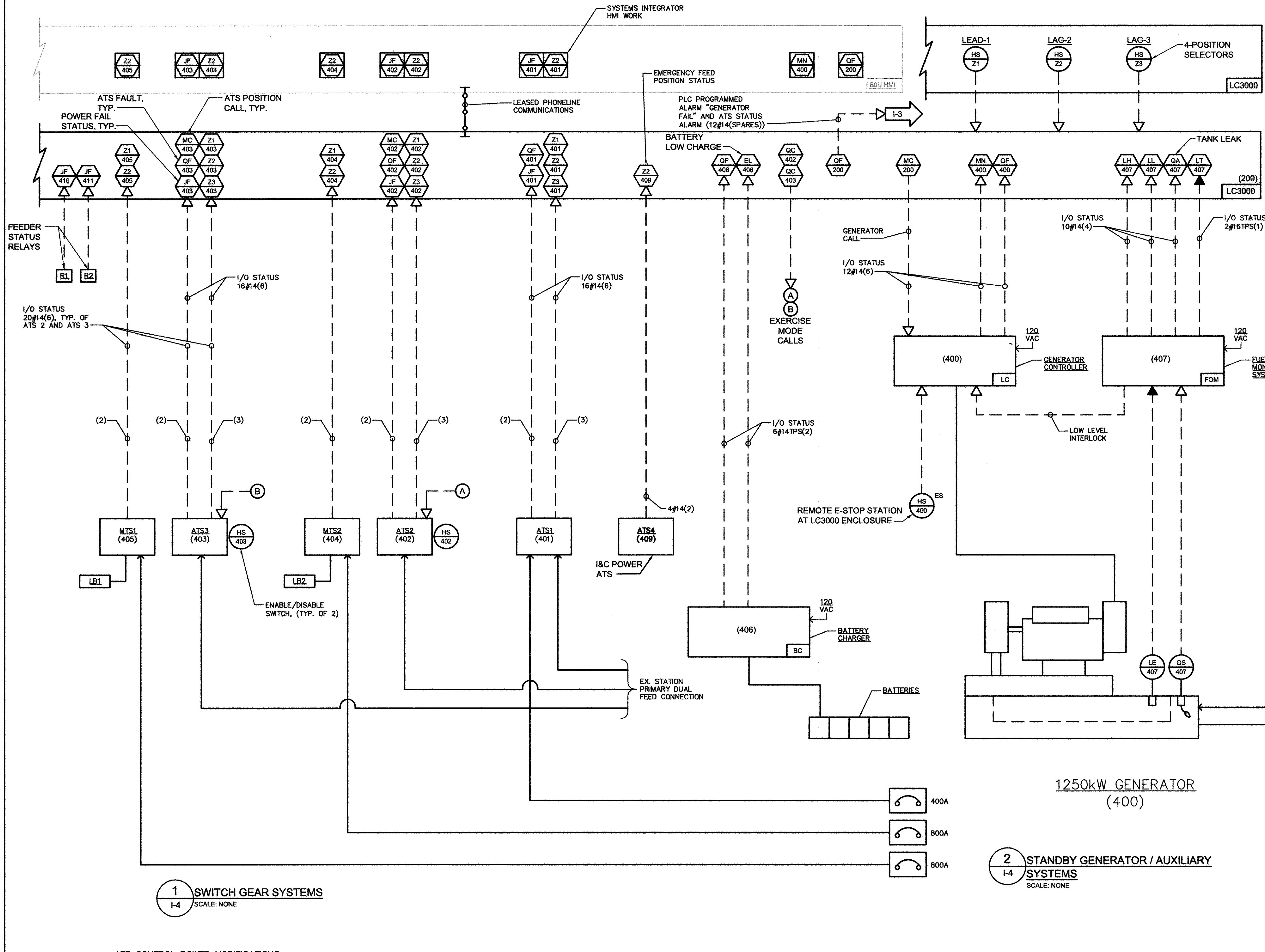
1000 SCALE MAP NO. 32 BLOCK NO.20

ELKRIDGE PUMP STATION IMPROVEMENTS

HOWARD COUNTY, MARYLAND
 CONTRACT NO. 44-4783
 ELECTION DISTRICT 1

KCI TECHNOLOGIES PROJECT No.: 13-12267718

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1 SWITCH GEAR SYSTEMS
1-4 SCALE: NONE

2 STANDBY GENERATOR / AUXILIARY SYSTEMS
1-4 SCALE: NONE

A FUEL OIL POLISHING SYSTEM PACKAGE
1-4 SCALE: NONE

- POLISHING SYSTEM ALARMS**
- F MAIN PUMP FAIL
 - F FLOOD ALERT
 - F DRAIN PUMP FAIL
 - SR CANISTER WATER HIGH
 - SR FILTER CHANGE REQUIRED
 - SR WASTE DRUM FULL
- GROUPED: F FAIL; SR SERVICE REQUIRED

STANDBY POWER TRANSFER SEQUENCE

- ONLY ATS UNITS 1, 2, AND 3 STATUS POWER FAIL TO RTU.
- THE LC3000 CALLS THE GENERATOR TO START WHEN BOTH FEEDER STATUS RELAYS INDICATE NO POWER AVAILABLE.
- EACH ATS POSITIONS BASED ON POWER RECOVERY SEQUENCE.
- THE GENERATOR CONTROLLER SHALL SEQUENCE ATS1, ATS2, AND ATS3 TO STEP THE LOADS DURING GENERATOR OPERATIONS. THE LOADS SHALL BE STEPPED AS FOLLOWS:
 - LOAD-1:** ATS1 SHALL BE CLOSED FIRST TO MAINTAIN ALL STATION CONTROLS AND AUXILIARY SYSTEMS. PROVIDE 1 MINUTE DELAY.
 - LOAD-2:** ATS2 SHALL BE CLOSED SECOND TO SUIT THE RTU FIRST STEP PUMP POSITION STATUS. PROVIDE 3 MINUTE DELAY.
 - LOAD-3:** ATS3 SHALL BE CLOSED THIRD TO SUIT THE RTU SECOND STEP PUMP POSITION STATUS.

LEGEND:

- NEW WORK
- EXISTING

ATS POSITION STATUS

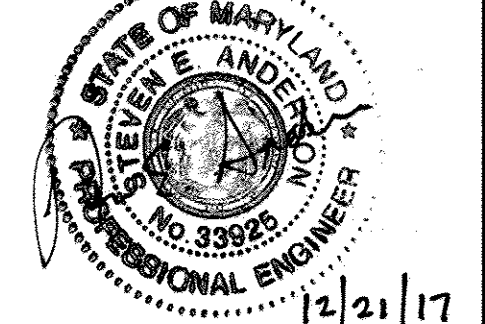
- Z1 LOAD POSITION
- Z2 EMERGENCY POSITION
- Z3 BYPASS POSITION

MTS POSITION STATUS

- Z1 LOAD BANK POSITION
- Z2 STATION POWER POSITION

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DES: SEA	JFW	AS-BUILT	12/22/2017
DRN: JFW			
CHK: SEA			
DATE: 10/2014	BY NO.	REVISION	DATE

**STANDBY POWER SYSTEMS
PROCESS AND INSTRUMENTATION
DIAGRAM**
1000 SCALE MAP NO. 32 BLOCK NO.20

**ELKRIDGE PUMP STATION
IMPROVEMENTS**
HOWARD COUNTY, MARYLAND
CONTRACT NO. 44-4793
ELECTION DISTRICT 1

1-4
SCALE AS SHOWN
SHEET
17 OF 21

AS BUILT REPLACEMENT SHEET

KCI TECHNOLOGIES PROJECT No.: 13-12267718

Dec 21, 2017 - 12:37pm User: kfc@kci.com
 M:\2013\1312267718\Drawings\AS-Built\Digital\Final As-Built\Control\13-12267718-PUMP CONTROLS-2.dwg

ELECTRICAL CONTROL DIAGRAM LEGEND (ECD):

- AT EQUIPMENT
- LOCAL CONTROL PANEL
- △ VFD/SSRVS
- ▲ MCC
- ⊖ HARMONIC FILTER

ELECTRICAL CONTROL DIAGRAM TERMINALS (ECD):

- PANEL WIREWAY TERMINATIONS
- WIRING CONNECTIONS
- REMOTE TERMINATIONS
- PANEL CONNECTIONS
- - - REMOTE CONNECTIONS
- ⊕ POWER SUPPLY CONNECTION

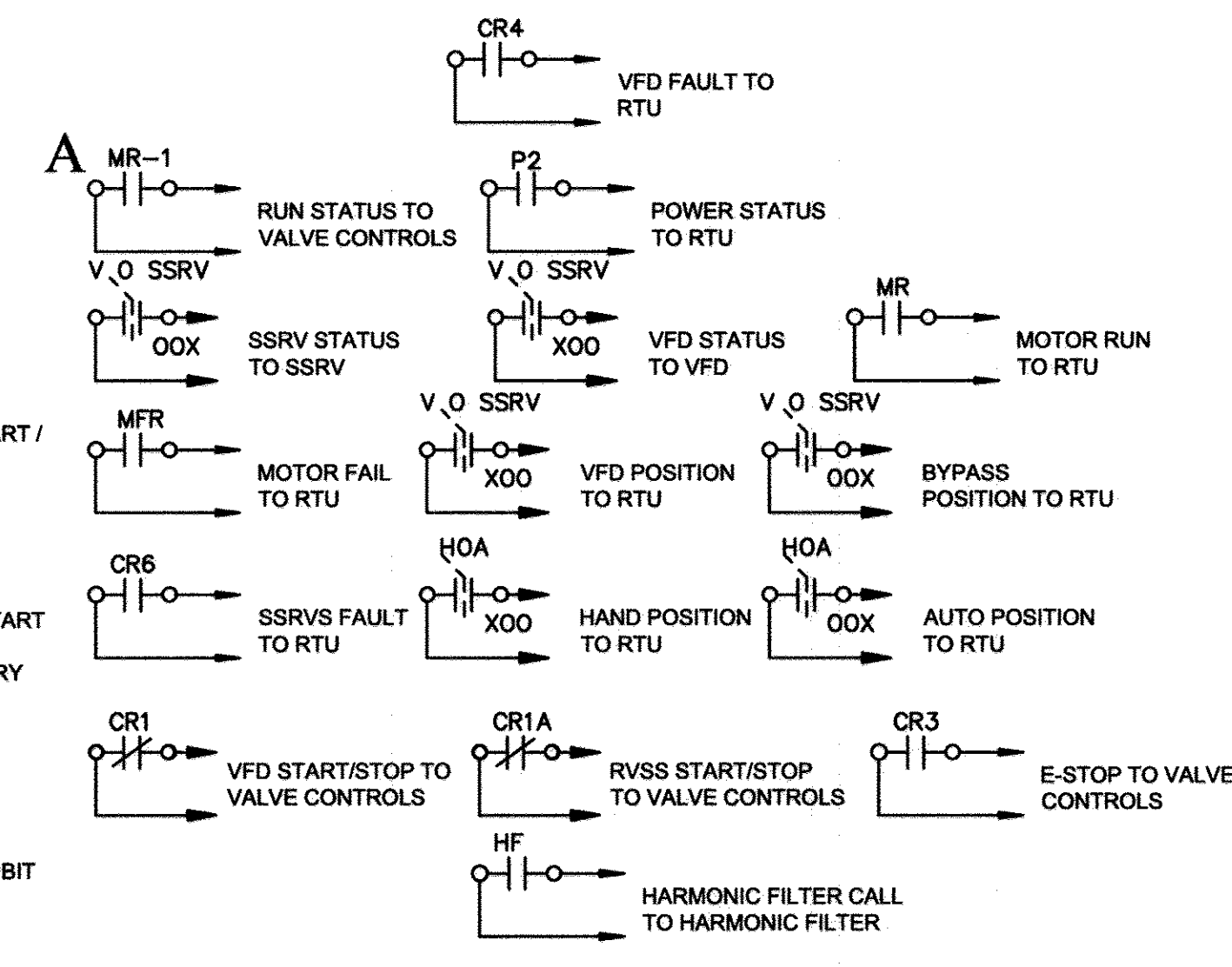
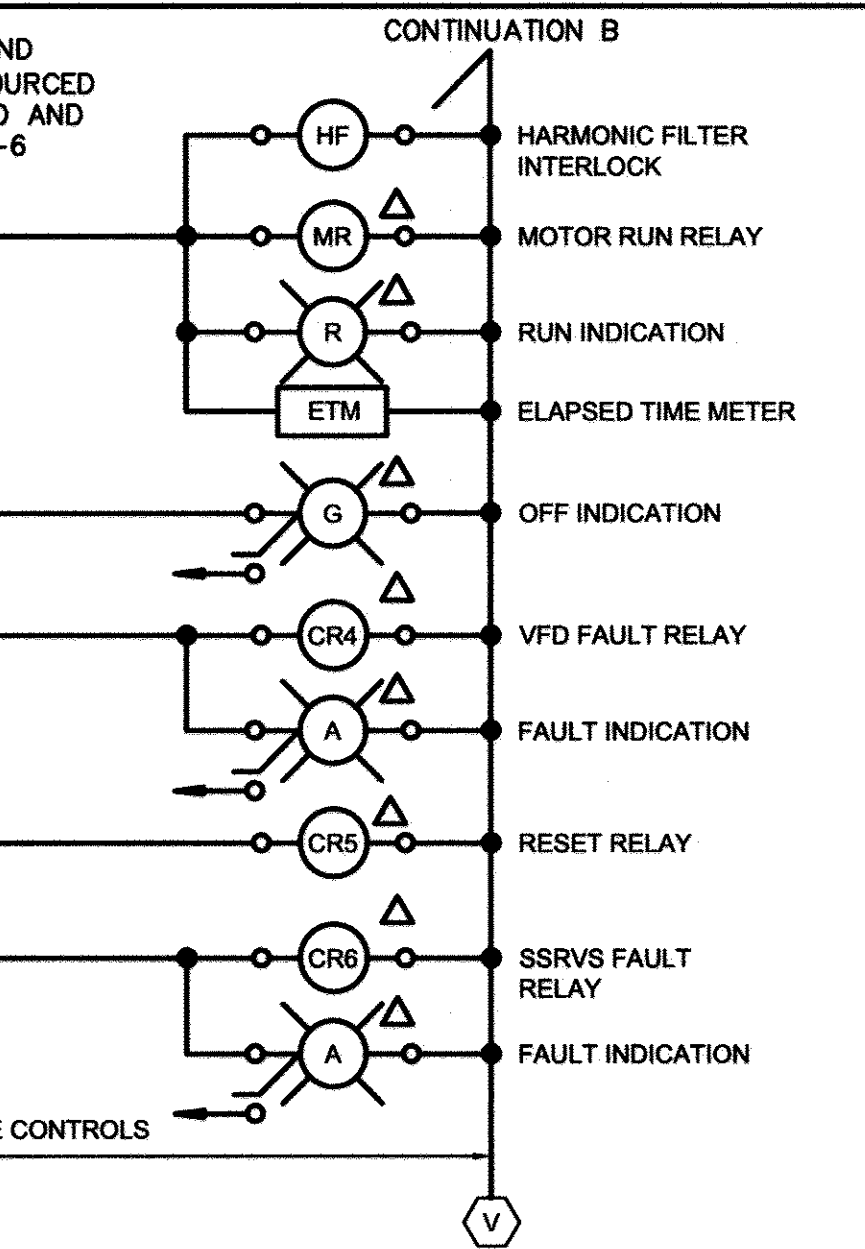
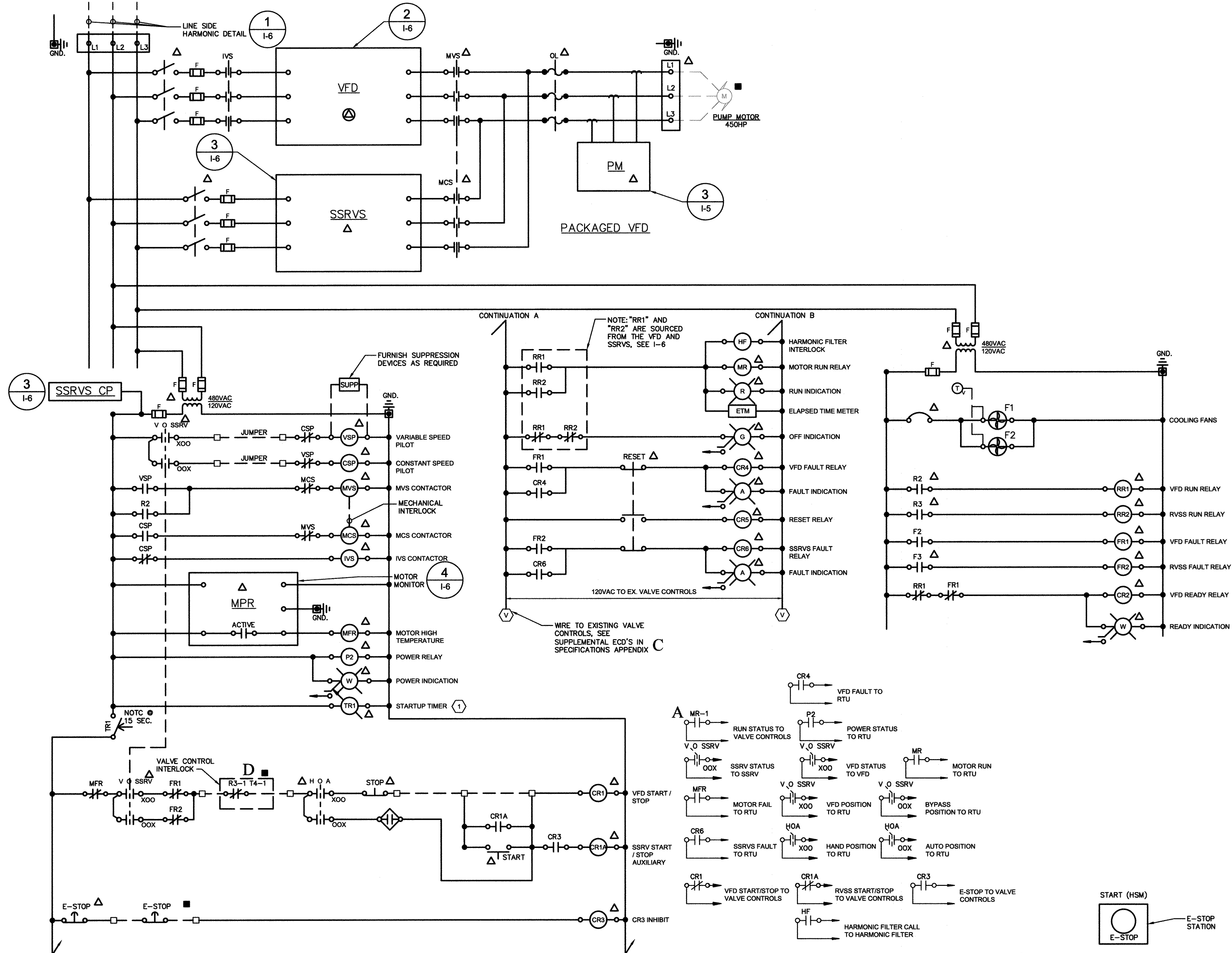
LEGEND:

- NEW WORK
- - - EXISTING
- X ECD CROSS-REFERENCE TO EXISTING VALVE CONTROLS, SEE SPECIFICATION APPENDIX-B

CONSTRUCTION NOTES:

- ① POWER START-UP TIMERS SHALL BE:
 - PUMP-1 - 15 SECONDS
 - PUMP-2 - 30 SECONDS

FOR APPROVED
DANFOSS VFD/SSRV
STARTER CONTROLS,
SEE O&M MANUAL



PROFESSIONAL CERTIFICATION.
 I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 33925, Expiration Date 11/15/19

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STATE OF MARYLAND PROFESSIONAL ENGINEER LICENSE NO. 33925 EXPIRES 11/15/19

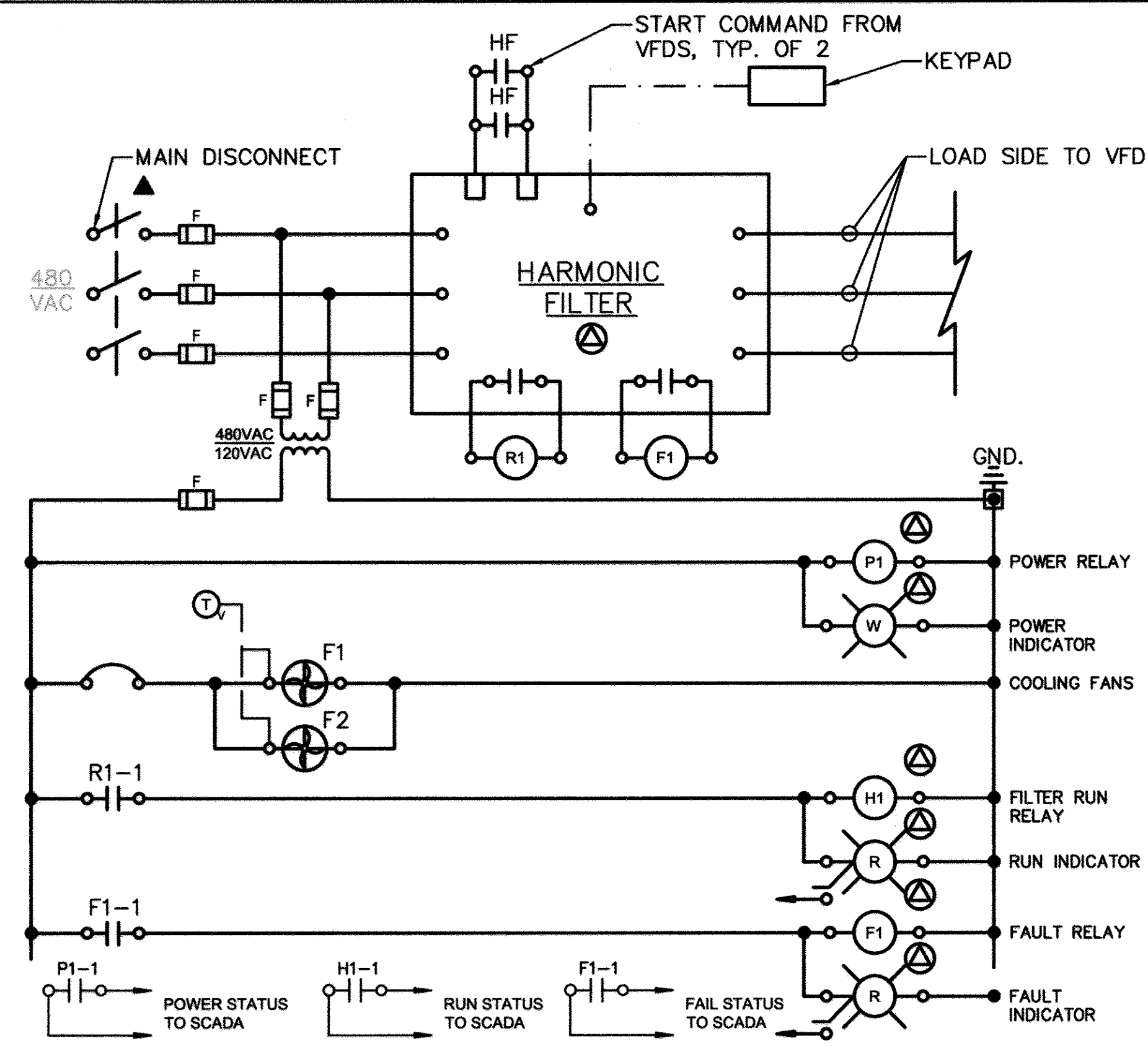
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DRN: JFW			
CHK: SEA			
DATE: 10/2014	BY NO.	REVISION	DATE

PUMP CONTROLS	
1000 SCALE MAP NO. 32	BLOCK NO.20

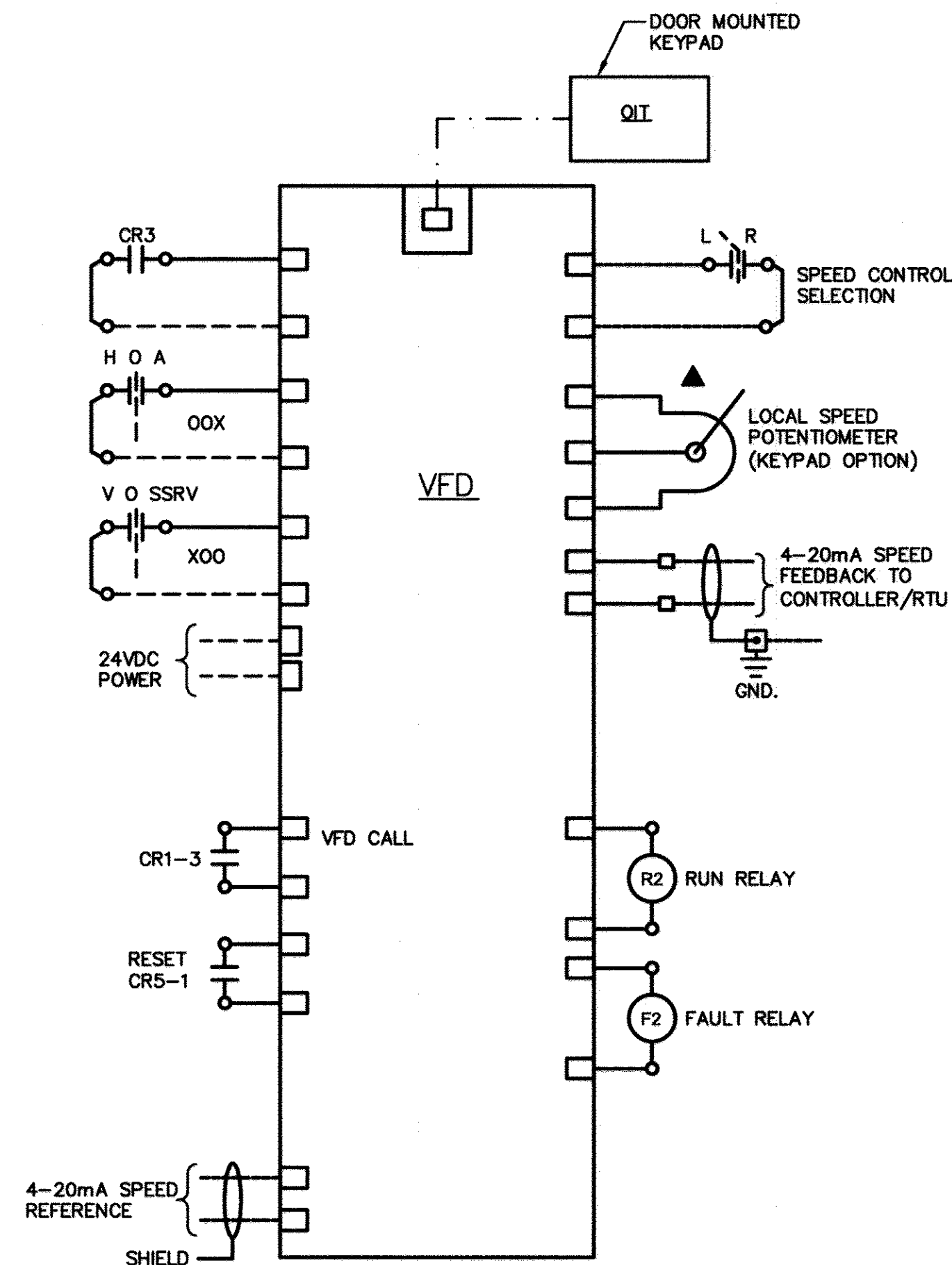
ELKRIDGE PUMP STATION IMPROVEMENTS
 HOWARD COUNTY, MARYLAND
 CONTRACT NO. 44-4793
 ELECTION DISTRICT 1

I-5
 SCALE AS SHOWN
 SHEET
 18 OF 21

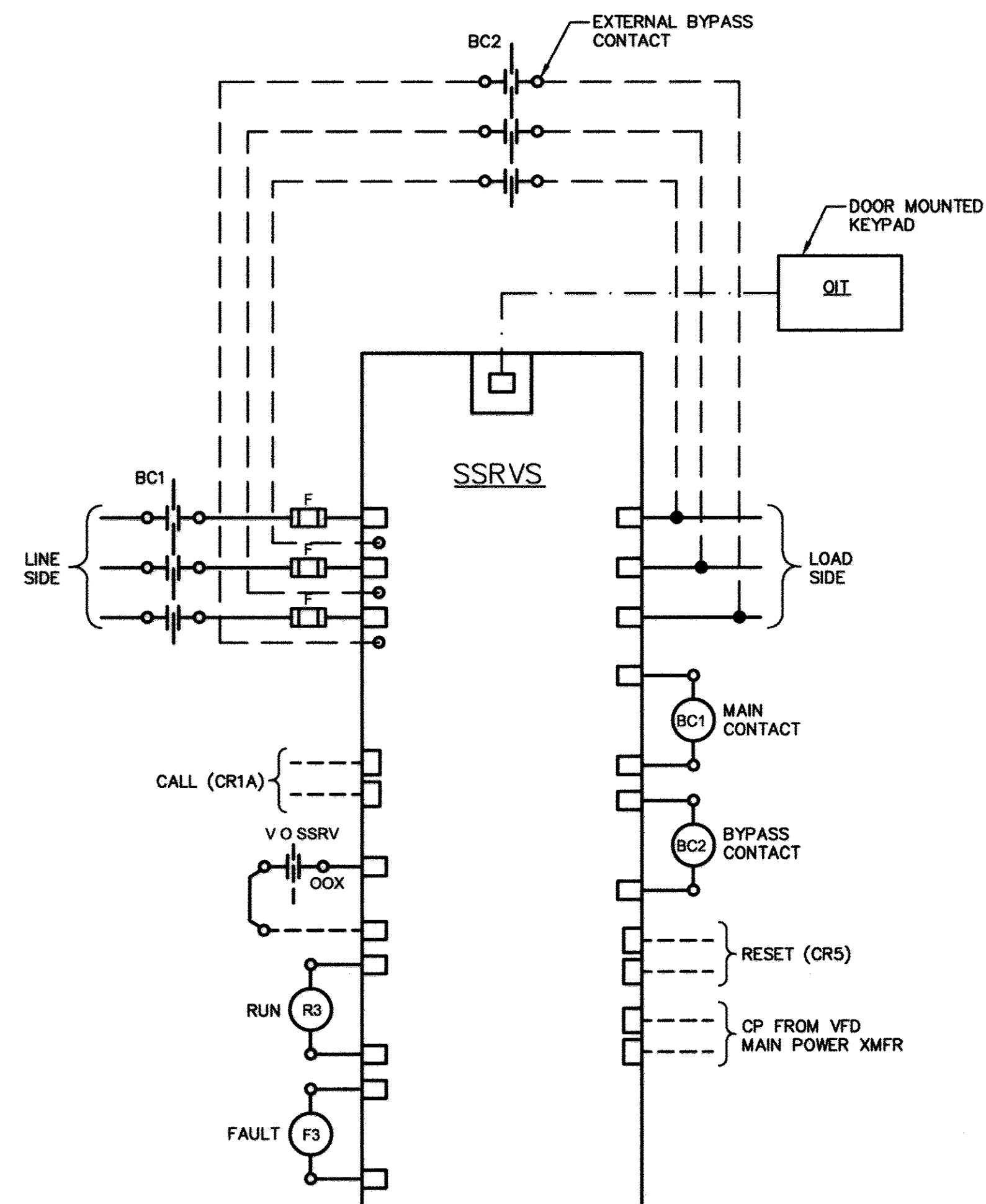
AS BUILT REPLACEMENT SHEET



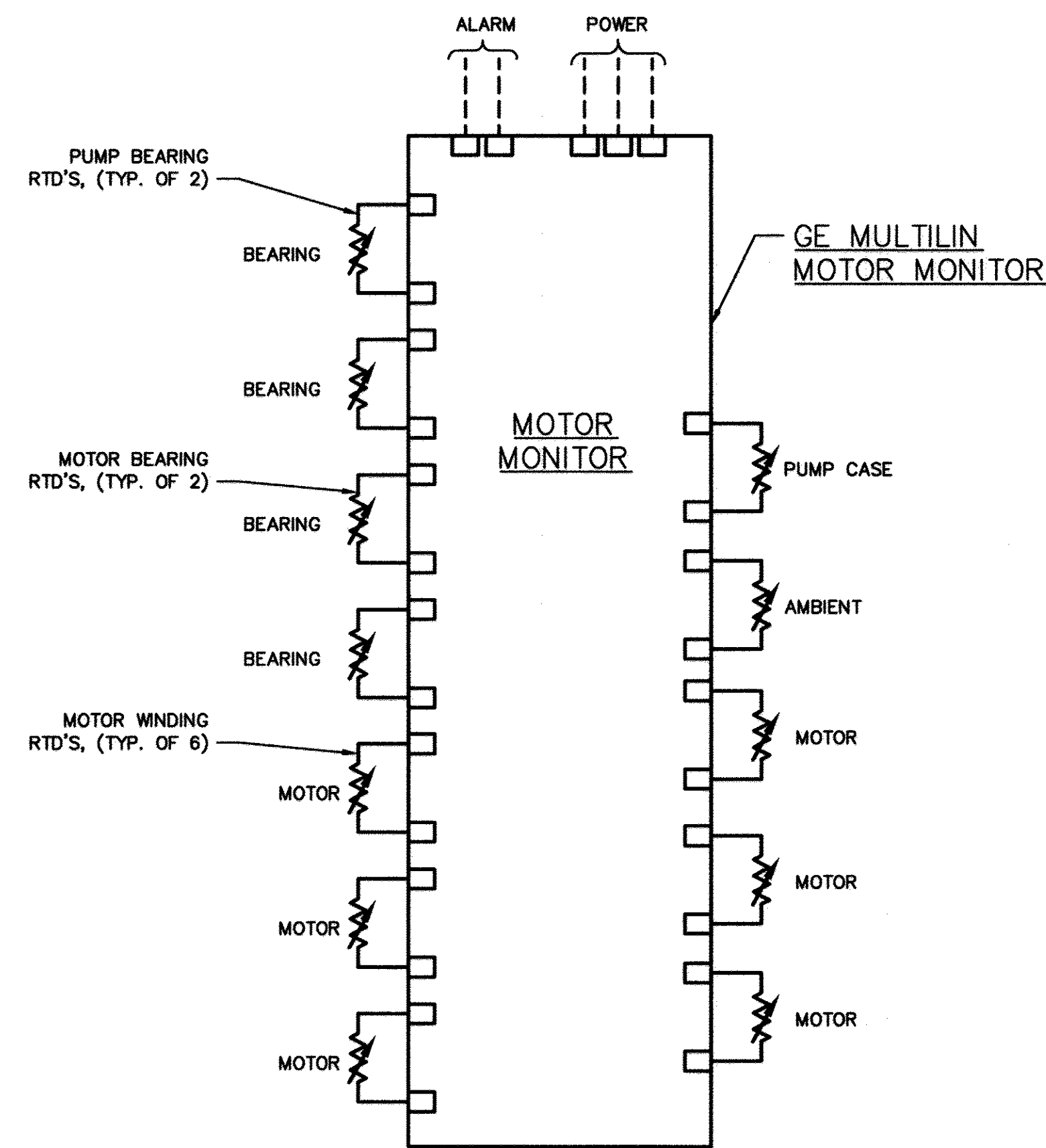
1 ECD: HARMONIC FILTER (HF)
 I-6 SCALE: NONE



2 ECD: VFD TERMINATIONS
 I-6 SCALE: NONE



3 ECD: SSRV STARTER TERMINATIONS
 I-6 SCALE: NONE



4 ECD: MOTOR MONITOR
 I-6 SCALE: NONE

- GENERAL NOTES:**
1. PROVIDE 24-INCHES SLACK WIRE AT EACH END OF ALL SPARE INSTRUMENTATION WIRES.
 2. SEE SYSTEM P&I DIAGRAMS AND ECD DETAILS FOR CONTROL WIRE IDENTIFICATIONS.
 3. CONDUIT CONTAINING #16 TPS (4-20mA) WIRE SHALL BE LOCATED 6-INCHES (MINIMUM) AWAY FROM CONDUIT CONTAINING POWER CONDUCTORS AND CONDUIT CONTAINING #14 OR #12 POWER AND DIGITAL SIGNAL WIRE.
 4. ALL CONDUIT SHALL BE 3/4-INCH IN SIZE UNLESS OTHERWISE NOTED ON INSTRUMENT RISER DIAGRAMS.
 5. SYSTEM INTEGRATOR SHALL VERIFY ALL APPROVED EQUIPMENT AND TERMINATIONS PRIOR TO INSTALLATION. THE SYSTEMS INTEGRATOR SHALL VERIFY ALL WIRE COUNTS AND INCLUDE SPARES AS SHOWN HERE IN AND ASSEMBLE INSTRUMENT RISERS FOR CONSTRUCTION. THE RISERS SHALL BE SUBMITTED FOR APPROVAL AS A SHOP DRAWING.
 6. SYSTEMS INTEGRATOR SHALL COORDINATE ANALOG SIGNAL CONDUIT QUANTITIES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

- CONSTRUCTION NOTES:**
- 1 ALL RELAYS SHALL HAVE L.E.D.S.
 - 2 ALL FUSES AND BREAKERS SHALL BE SIZED IN ACCORDANCE WITH THE ELECTRICAL DRAWINGS AND THE MCC MANUFACTURERS RECOMMENDATIONS.
 - 3 LIMIT SWITCH POSITION STATUS SIGNALS CAN BE COMBINED WITH THE MOD CONTROL POWER CONDUCTORS.
 - 4 CONTRACTOR TO COORDINATE APPROVED LOCATION WITH COUNTY FIRE MARSHAL.

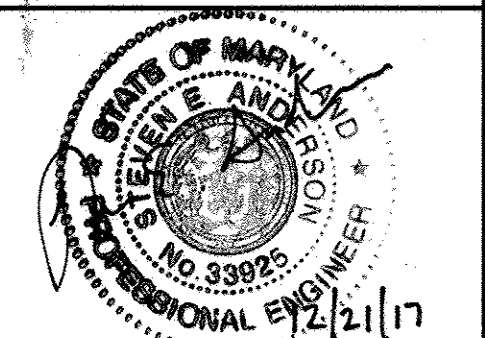
- ELECTRICAL CONTROL DIAGRAM LEGEND (ECD):**
- AT EQUIPMENT
 - LOCAL CONTROL PANEL
 - △ VFD/SSRV
 - ▲ MCC
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- ELECTRICAL CONTROL DIAGRAM TERMINALS (ECD):**
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FOR APPROVED
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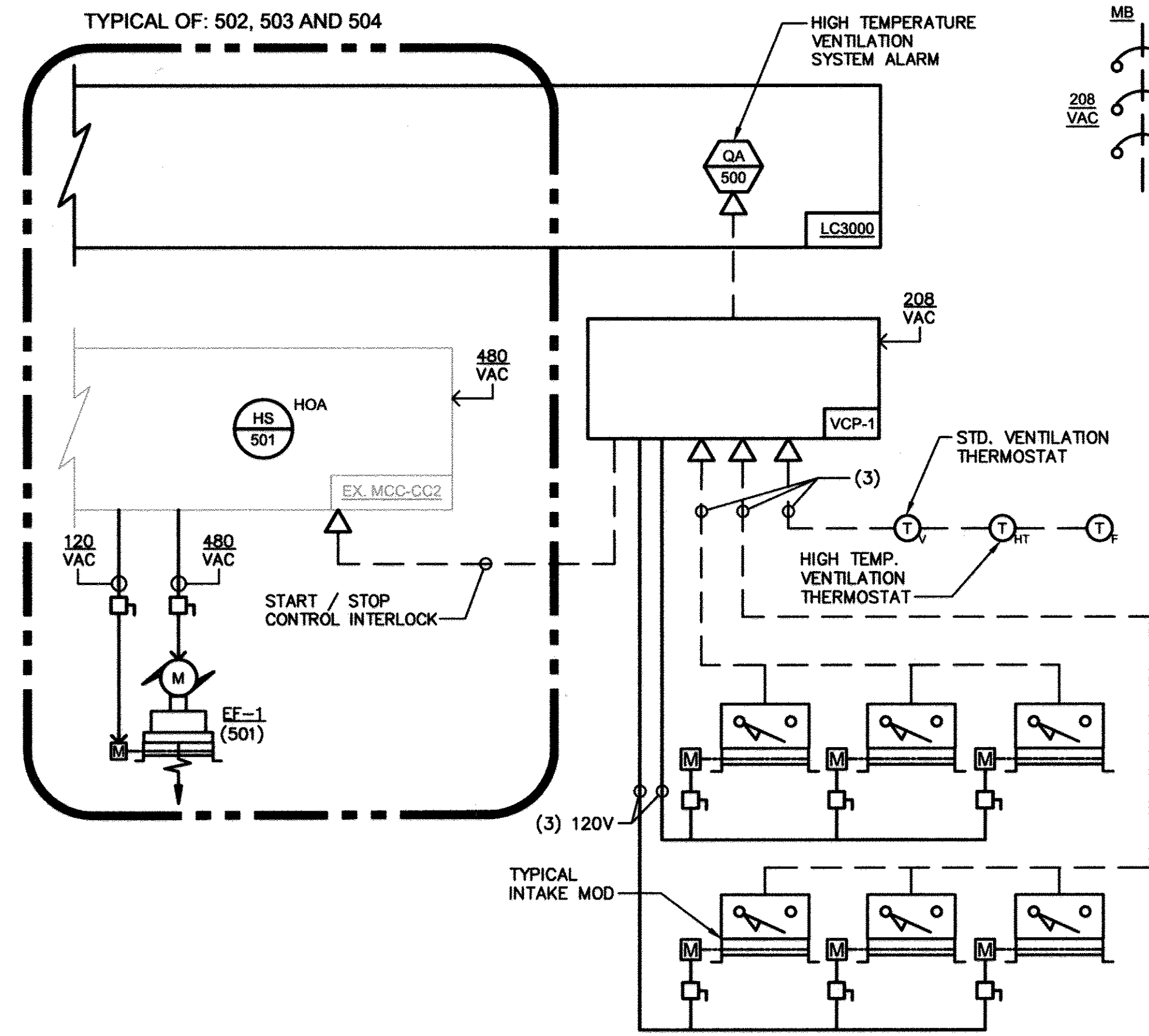
1000 SCALE MAP NO. 32	BLOCK NO.20
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ELKRIDGE PUMP STATION IMPROVEMENTS
 HOWARD COUNTY, MARYLAND
 CONTRACT NO. 44-4793
 ELECTION DISTRICT 1

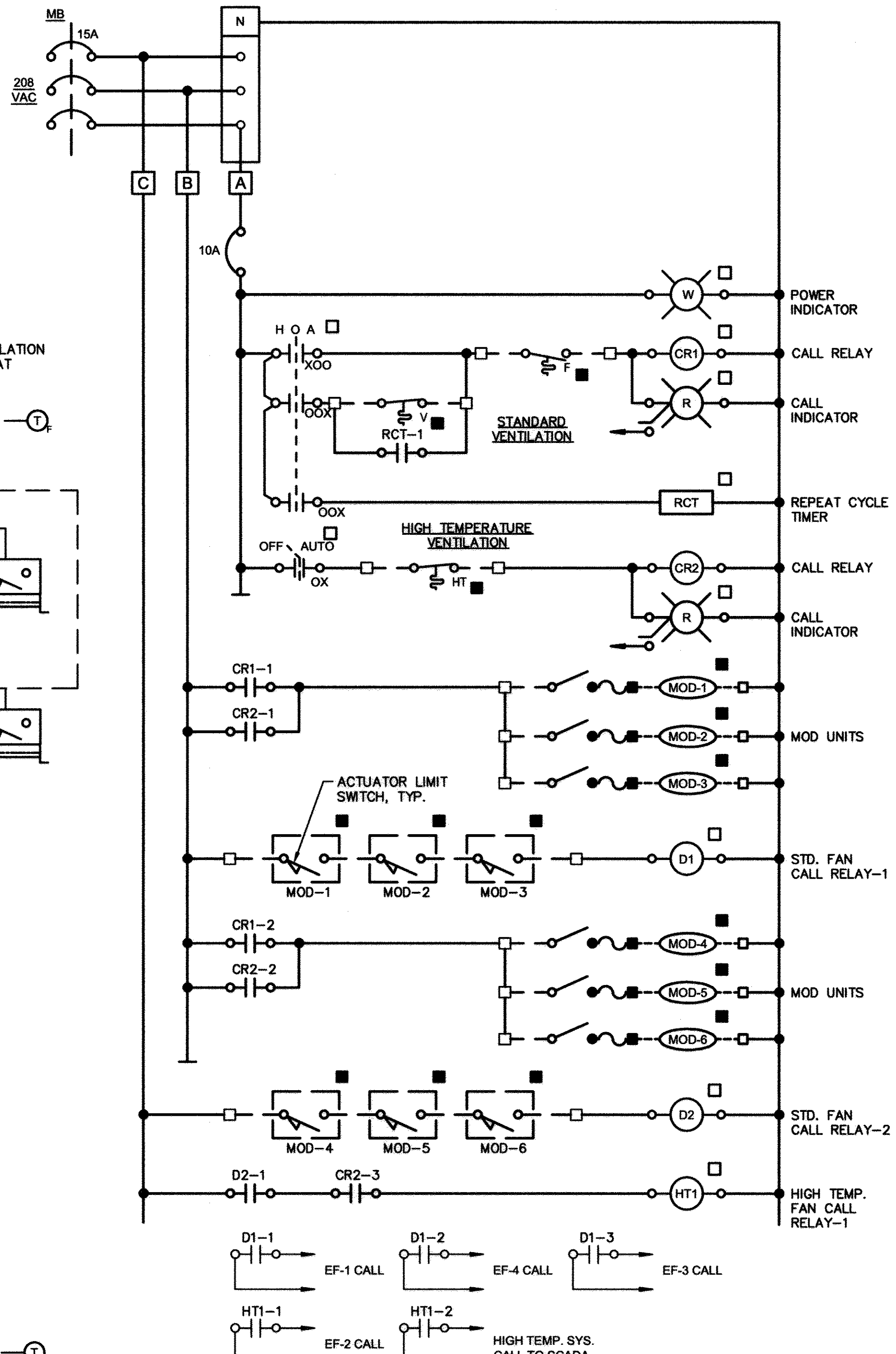
1-6
 SCALE AS SHOWN
 SHEET 19 OF 21

KCI TECHNOLOGIES PROJECT No.: 13-12267718

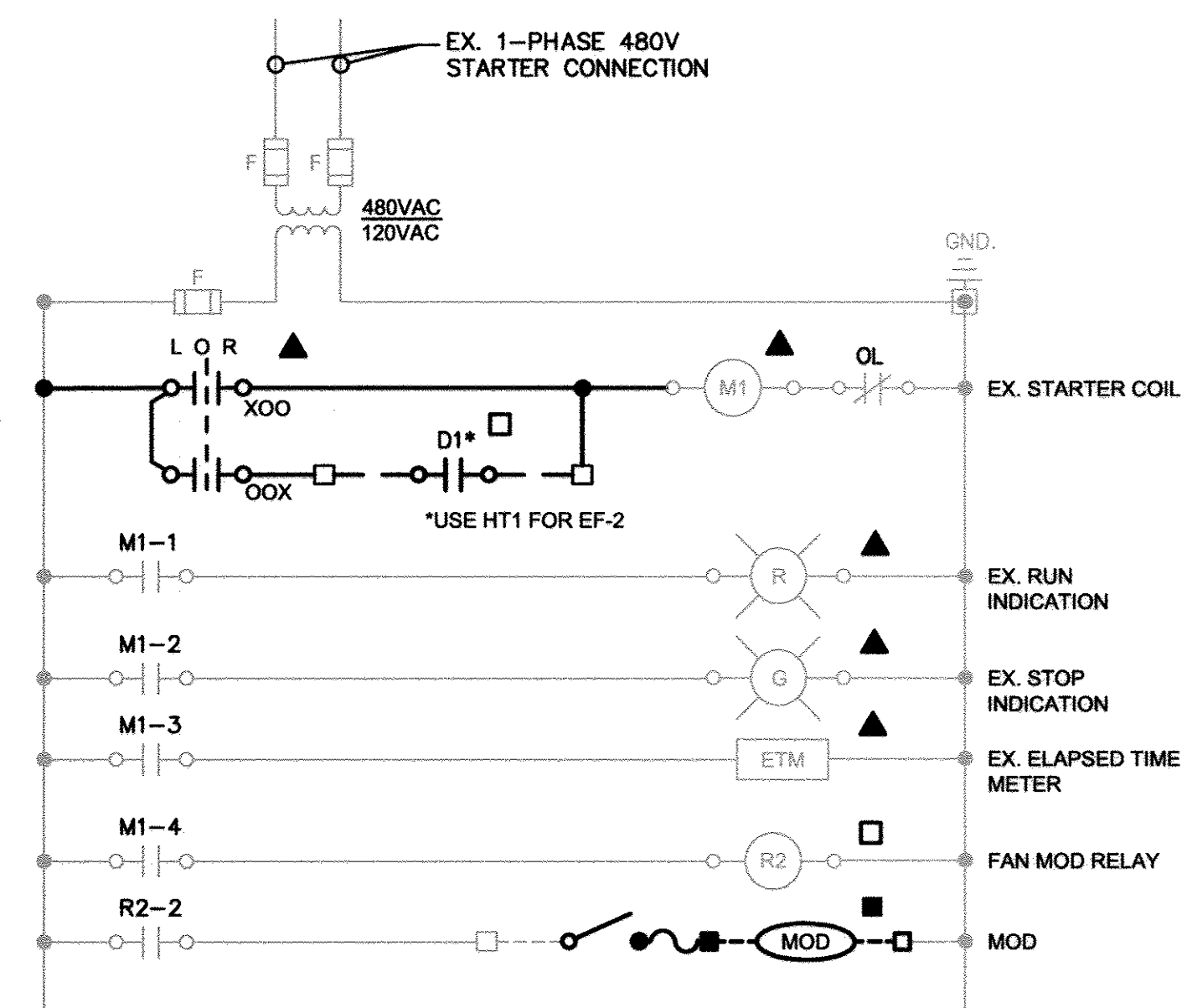
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 W:\012\1312267718\Drawings\AS-Built\Drawings\Final As-Built\Controls\44-4793\8 VENTILATION CONTROLS AND DETAILS.dwg



1 P&ID: VENTILATION SYSTEM
 I-8 SCALE: NONE

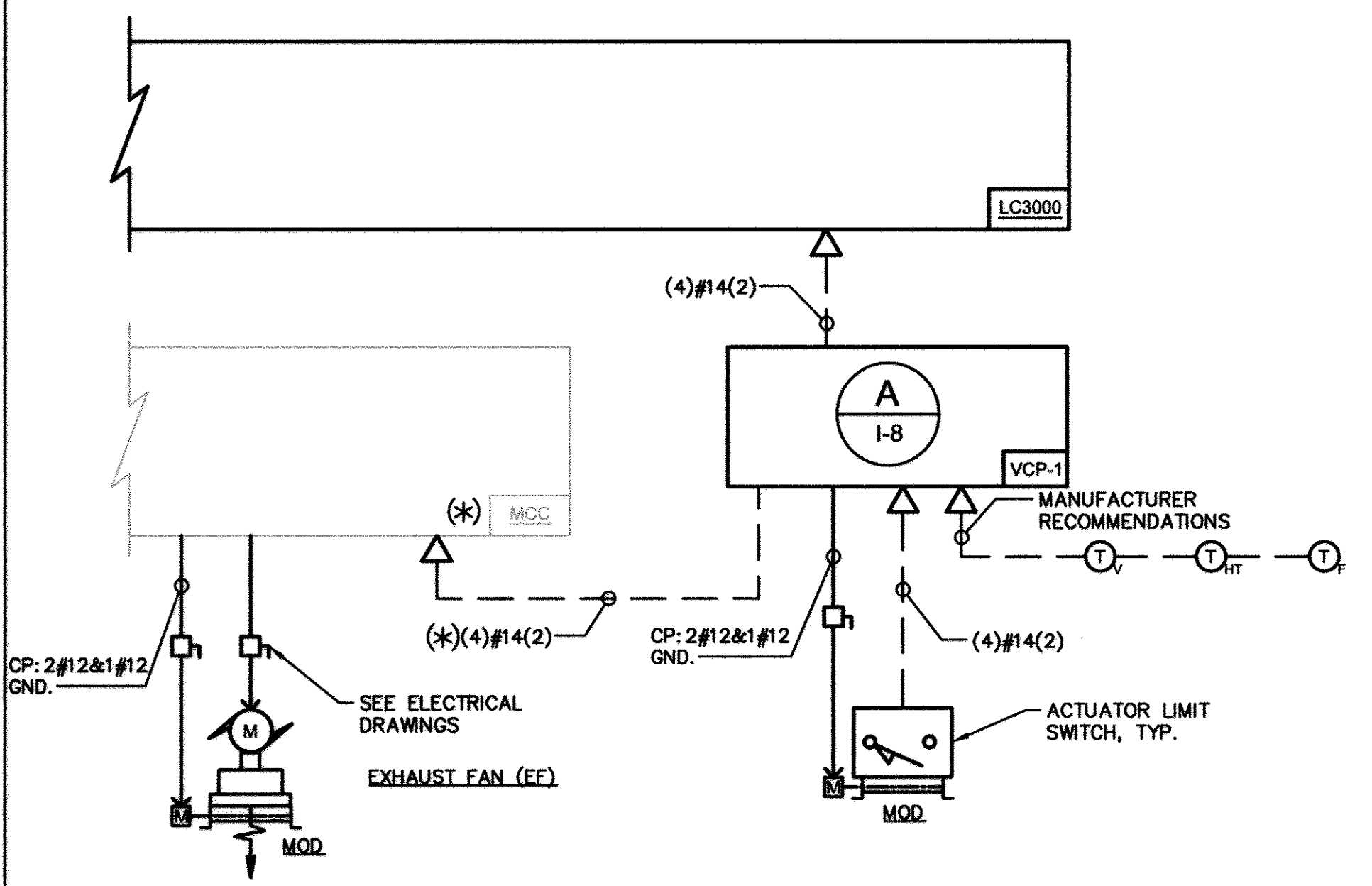


3 ECD: VENTILATION CONTROL PANEL
 I-8 SCALE: NONE

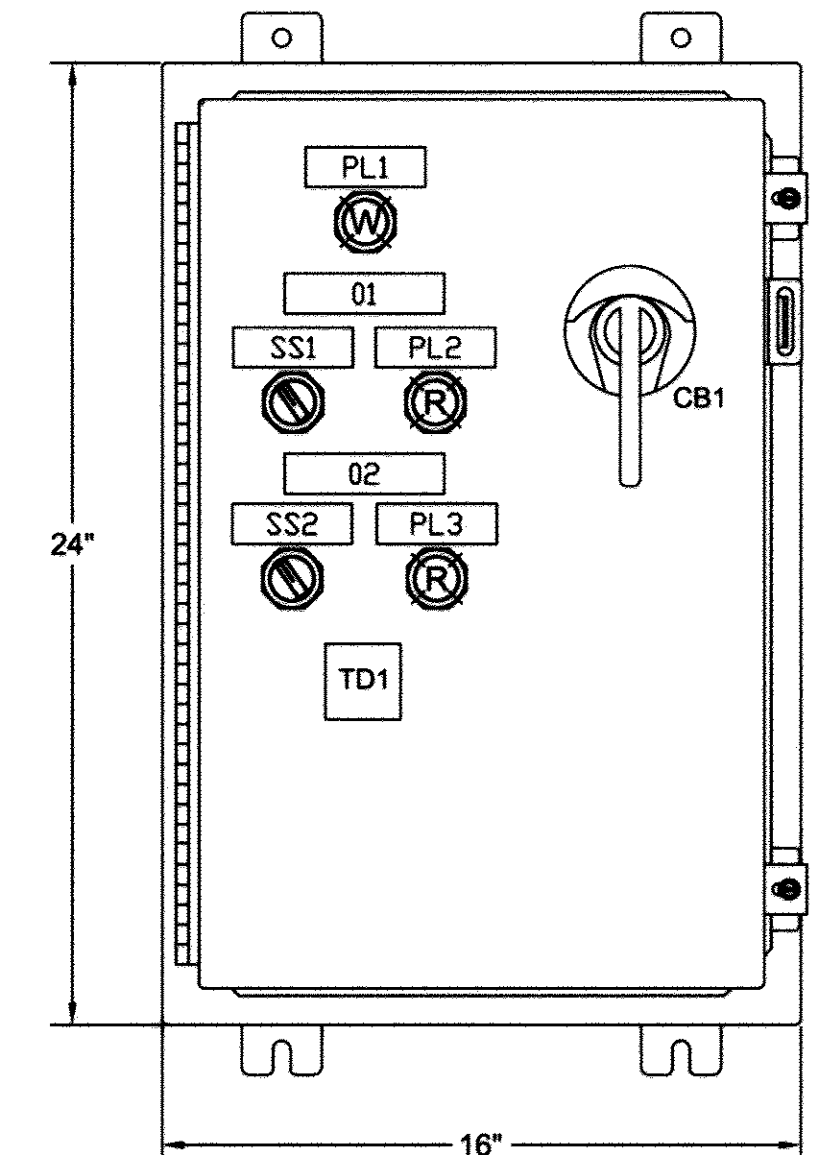


NOTES:
 1. REMOVE H-O-A START / STOP PUSHBUTTONS, AUTOMATIC CONTACT CONNECTION, SECONDARY CALL RELAY AND POWER CONNECTIONS TO INTAKE MOTOR OPERATED DAMPERS.
 2. BLANK-OFF UNUSED MCC-DOOR OPENINGS.

4 ECD: MCC-CC2 STARTER VENTILATION MODIFICATIONS
 I-8 SCALE: NONE



2 RISER DIAGRAM: TYPICAL EXHAUST FAN
 I-8 SCALE: NONE



A ELEVATION: VCP-1
 I-8 SCALE: NONE

NAMEPLATE SCHEDULE				
TAGNAME	DESC1	DESC2	DESC3	SIZE
O1	STANDARD VENTILATION			1X4
O2	HIGH TEMP VENTILATION			1X4
PL1	POWER ON			1X3
PL2	CALL			1X3
PL3	CALL			1X3
SS1	HAND OFF AUTO			1X3
SS2	OFF AUTO			1X3

NAMEPLATES ARE BLACK WITH WHITE LETTERS

NOTES:
 1. ENCLOSURE IS A NEMA TYPE 12 WALL-MOUNT HOFFMAN A241608LP, WITH INNER PANEL HOFFMAN A24P16.
 2. FINISH IS ANSI 61 GRAY.
 3. UL 508A

- GENERAL NOTES:**
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 - - - REMOTE CONNECTIONS
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- CONDUIT LEGEND:**
 A#14-B C (C)
- A - QUANTITY OF CONDUCTORS
 B - SIZE OF CONDUIT (LARGER THAN 3/4-INCH)
 C - QUANTITY OF SPARE CONDUCTORS INCLUDED IN TOTAL COUNT (ITEM-A)
- EQUIPMENT LEGEND:**
- EF-X EXHAUST FAN
 - MOD-X MOTORIZED OPERATED DAMPER
 - VCP-X VENTILATION CONTROL PANEL
 - EX. RTU LC3000 CONTROLLER
 - EX. MCC CC2 MOTOR CONTROL CENTER
 - EX. SCADA MICROCAT 9610 CONTROLLER
 - T_v VENTILATION THERMOSTAT
 - T_{HT} HIGH TEMPERATURE VENTILATION THERMOSTAT
 - T_F VENTILATION FREEZESTAT

- LEGEND:**
- NEW WORK
 - NEMA BOUNDARY
 - - - SIGNAL CONDUIT

SEE WHEL-TECH O&M MANUAL FOR APPROVED CONTROLS AND AS-BUILT CONDITIONS

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VENTILATION CONTROLS AND DETAILS

1000 SCALE MAP NO. 32 BLOCK NO.20

ELKRIDGE PUMP STATION IMPROVEMENTS
 HOWARD COUNTY, MARYLAND
 CONTRACT NO. 44-4793
 ELECTION DISTRICT 1

SCALE AS SHOWN
 SHEET 21 OF 21

AS BUILT REPLACEMENT SHEET